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VI. Diggle's Steam-Engine; Kemp's Apparatus for Raising Sunken Vessels; Bridson's Bleaching Apparatus; Aitkin's Cotton Machinery; and Douglas's Boilers.

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Recent Patents.

To ANDREW SMITH, *of Princes-street, in the parish of St. Martin-in-the-Fields, and county of Middlesex, engineer, for his invention of certain improvements in engines for exerting power for driving machinery, and for raising and lowering heavy bodies.*—[Sealed 12th February, 1836.]

THESE improvements in engines for exerting power for driving machinery, and for raising and lowering heavy bodies, consist, in the first instance, in a mode of converting the power exerted by a reciprocating piston working in a steam cylinder into a rotary power, through the agency of rods, chains, cords, or bands, connected to the piston rod, and to pulleys carrying driving clicks or pawles, which take into clutches fixed upon the shaft intended to revolve.

Secondly, in the adaptation of a peculiarly formed rotary cam to the said revolving shaft, for the purpose of working the slide valve of the steam cylinder.

Thirdly, in a mode of reversing the rotary action of the shaft by shifting the positions of the driving clicks or pawles. In Plate I., fig. 1, is a longitudinal section of a locomotive engine running upon a railway, the boiler being omitted, as forming no part of the invention. Fig. 2, is a horizontal view of the same; to which locomotive engine the proposed improvements are attached: *a, a,* is the framework of the carriage; *b,* the working cylinder of the engine attached to the carriage in a horizontal position by brackets; *c, c,* is the pipe for conducting steam from a boiler to the cylinder; *d, d,* is the piston rod passed through both ends of the cylinder, which rod is connected by an endless chain or chains *e, e,* to the pulleys *f,* and *g.* The pulley *f,* is fixed upon a shaft *h,* turning in bearings in the frame of the carriage; and to this pulley one end of the piston rod is connected by the chain *e.* On the same shaft *h,* another similar pulley *i,* is also fixed; consequently, both pulleys *f,* and *i,* with their shaft *h,* revolve together. The pulley *g,* is hollow, and turns loosely in one direction upon the axle *k,* of the running wheels, to which the driving power is applied. Upon this axle is affixed a clutch *l,* within the hollow pulley, as represented in the longitudinal section of the pulleys *f,* and *g,* shown in fig. 3. To the inner side of the pulley *g,* the click or pawle *m,* is attached by a pin, and as the pulley revolves in the direction of the arrows, the point of the click or pawle, in striking against the clutch *l,* causes it and the axle *k,* with the running wheels, to be driven round. Another similar hollow pulley with a clutch and pawle is also, in like manner, mounted upon the shaft of the running wheels at *n*, fig. 2, opposite to the pulley *i*; and a crossed endless chain, or chains and rods *o*, *o*, attached to and extending round both the pulleys *i*, and *n*, communicates the rotary motion of the pulley *i*, to the pulley *n*.

The elastic force of the steam in the working cylinder *b*, by moving the piston in the direction of the arrow, will give rotary motion to the pulleys *f*, and *g*, and cause the click or pawle *m*, in the pulley *g*, to act against the clutch *l*, and drive it round with the running wheel-shaft half a revolution. On the returning stroke of the piston the endless chain *e*, *e*, will drive the pulley *f*, with its shaft *h*, and the other fixed pulley *i*, in the reverse direction to their arrows, when the crossed endless chain *o*, *o*, will give rotary motion to the pulley *n*, in the same direction that the pulley *g*, moved before, and cause its click or pawle to act upon its clutch, and thus to complete the entire rotation of the running wheel-shaft, the pulley *g*, slipping round on the shaft *k*, in the reverse direction to that in which it moved when actuating the running wheels. Thus the force of the reciprocating action of the piston in the working cylinder will be converted into a continuous rotary movement in the shaft *k*, which may be employed as a power for driving a locomotive carriage, or for actuating any other kind of machinery.

As it is not the intention of the Patentee to confine himself to the horizontal position in which the working cylinder is placed in figs. 1, and 2, or to attaching the chains *e*, *e*, to both ends of the piston rod, we have shown at fig. 4, a partial elevation of a locomotive engine, in which the improvements are adapted to work in a vertical direction, and from one end only of the piston rod. The carrier pulleys *f*, and *i*, upon their shaft *h*, and the driving pulleys *g*, and *n*, upon the running wheel-shaft *k*, as well as the connecting chains *e*, *e*, and *o*, *o*, the working cylinder *b*, and piston rod *d*, are all placed in situations suited to perform their functions, as described in reference to figs. 1, and 2. The four pulleys *f*, *i*, *g*, and *n*, as situate in the carriage, fig. 4, are shown detached and in section at figs. 5, and 6; and here it will be seen that the clutches *l*, *l*, are of a snail form, and that the clicks or pawles *m*, *m*, are, in this instance, acted upon by springs which continually press them against the peripheries of the clutches; and from the cross-head of the piston rod being connected to both chains, that side of the crossed chain *o*, to which it is attached, must be kept in a vertical direction by a guide pulley, or otherwise, as shown in fig. 6.

Fig. 7, is a sectional representation of the peculiarly-formed rotary cam and its appendages, by means of which the steam valve is slidden. The position of this cam fixed upon the axle *k*, of the running wheels, is shown at *p*, in fig. 2. The cam is formed by the peripheries of two segments of circles of different radii, and by two inclined planes. A bent lever *q*, mounted upon a fulcrum pin or stud *r*, is connected at top to the rod *s*, of the slide valve, and at bottom carries an anti-friction roller which runs against the periphery of the cam; hence, by the rotation of the axle *k*, the different elevations of the revolving cam will cause the lever *q*, to be moved at the opposite points of its rotation into such positions as shall open and close the steam valve.

On the outside of the pulley *g*, is represented in fig. 1, a handle *t*, which is fixed upon a square stud extending from the pawle *m*. By turning this handle, the pawle *m*, may be shifted into the position shown by dots, when it will take hold of the opposite side of the clutch *l*, to that described above; and in performing its reciprocating rotary movement, will necessarily drive round the axle *k*, and the running wheels in the reverse direction.—[*Inrolled in the Rolls Chapel Office, August*, 1836.]

To FRANCOIS PEYRE, *Jun., of St. Etienne, in the kingdom of France, dyer, now residing at the White Hart Inn, in the Borough of Southwark, for certain improvements in the means of economising fuel in ships' hearths, or cooking apparatus, and of obtaining distilled water from sea water, which improvements apply to generating steam, being a communication from a foreigner.*—[Sealed 23rd February, 1836.]

THIS invention of improvements in the means of economising fuel in ships' hearths, or cooking apparatus, and obtaining distilled water from sea water, and which also applies to generating steam for other purposes, is principally designed to promote a very rapid distillation of fresh water from sea or salt water, and in a better state for drinking than has heretofore been obtained, and which is effected in a ship's hearth, cabouse, or cooking apparatus, without consuming more fuel than that which is necessary to perform the ordinary cooking operations. The principal novel feature consists in causing a volume of heated air to be injected into the salt water contained in the boiler from time to time as required, by means of a blower bellows or air-injecting pump, or other convenient apparatus, for the purpose of increasing the ebullition and evaporation of the water. And further, these improvements consist in mixing with the sea water in the boiler alum and sulphuric acid, for the purpose of preventing the crystallization or incrustation of saline particles on the interior of the boiler, and preventing any impurities from passing off with the steam or vapour. And also, after the water has been discharged from the apparatus mixed with a portion of sulphuric acid and charcoal, in blowing or forcing cold atmospheric air into such distilled water, for the purpose of taking away the disagreeable taste or flavour which distilled water generally has acquired, and restoring what may be called its aeriated properties, which have been destroyed or removed by the process of distillation, and rendering the distilled water more like spring or fresh water in taste or flavour and relish to the palate.

The several figures in the following description are representations of one construction of a ship's hearth, or cooking apparatus, which will serve to illustrate this invention; but the Patentee does not intend to confine himself to the precise form or arrangement there shown, as the same may be varied to suit different circumstances.

At each time the boiler is filled with sea water, and previous to any evaporation taking place, sulphuric acid and alum is to be introduced and mixed with the water, in the proportion of about four ounces of alum and one ounce of sulphuric acid to about twenty-five gallons of salt water, or the alum alone may be used if desired, the intention being that the sulphuric acid may arrest any deleterious vapours or other matters which might otherwise arise and pass off with the steam, and that the alum may assist in preventing the crystallization of the salt and its incrustation on the boiler, or the alum and sulphuric acid may be mixed with the sea water previous to its being introduced into the boiler.

Fig. 8, Plate I., is a front elevation of the cabouse complete, with its furnace, cooking apparatus, and condensers. Fig. 9, is a plan or horizontal view of the same. Fig. 10, is a vertical section taken in the line a, b, showing the interior construction of the furnace and its flues, with the boiler and its steam chamber, or separator, and also the condensers or refrigerators. Fig. 11, is a horizontal section taken in the line c, d; and fig. 12, is another horizontal section taken in the line e, f.

The ship's hearth, or cooking apparatus, consists of four principal parts; viz. the fire-place, the boiler, and its steam chamber, the condensers, and the bellows: A, is the fire-place; B, the boiler or generator, containing the salt or sea water; C, the steam chamber, in which the boiling or stewing cooking vessel *a, a, a,* are placed, fitting steam tight into the top of the chamber D, D, are the condensers, one or both of which may be used at one time; E, is the bellows or air pumps; *b, b,* are the ovens for baking meat or other food, and are placed one on each side of the fire-place, or only one may be used. The operation is as follows: the smoke and heated vapours arising from the combustion of the fuel pass from the fire-place A, along the several tubular flues *c, c,* intersecting the boiler, and after parting with the greater portion of its caloric to the salt water, makes its exit by the chimney *c.** The flues should at all times be covered with salt water, and have proper apertures and doors for cleaning them out. The steam arising from the ebullition of the sea water passes up the tube *d,* and descending by the hood or cap *e,* enters the steam chamber C, and after parting with the greater portion of its caloric to the cooking vessels *a, a,* passes off in the form of distilled water and steam by the pipe or passage *f,* into the worm-head *g,* which is surrounded with the cold water in the condenser D. The remaining uncondensed steam vapour and hot water passing down the coiled worm *h, h,* become refrigerated, the distilled water making its exit at the cock *i.* The air pumps or bellows for forcing a blast of hot air into the salt water in the boiler may be of any suitable construction, and placed in any convenient situation; those I prefer are cylindrical bellows, made of leather and wood in the ordinary way, and they may be worked in any convenient manner. In the arrangement shown in the drawing, they are worked by a winch handle *k*, which, by means of the crank *l*, and connecting rod actuates the cross shaft *m*, which gives motion by means of the short lever *n*, and its connecting rod to the cylindrical bellows in the case E. The blast of air passes from the bellows by the pipe *o*, into the hollow grating or fire bars *p*, of the furnace, and after being heated in its passage by the ignited fuel on the bars goes off by the pipe *q*, and is discharged into the sea water near its end, the bore or apertures being plugged up or closed, and the end of the pipe is pierced with small holes, the better to distribute the air in the water. The tube *q*, is carried upwards into the pipe *d*, to prevent the escape of the sea water out of the boiler by the pipe *o*, when the bellows are not at work. The hot air thus blown into the water rises through it in the form of bubbles with the steam, and greatly increases the ebullition and evaporation; the steam, air, and condensed water passing together into the refrigerator as before stated: *y*, is a reservoir for supplying the condenser with cold water for refrigeration, but they may be filled through a funnel placed at the top part, or by a pipe connected with pumps, or in any other convenient manner; the cold water enters the lower part of the condenser by the pipe *r*, and rises up to the top part, where it becomes warm, and is drawn off by the pipe *s*, to supply the boiler B, as required: when the water in the condensers becomes too hot for refrigeration, it it can be drawn off by the pipe *t*, and fresh supplied from the reservoir, or a continuous stream of cold water may be made to pass through the condensers, if desirable.

It may be here remarked, that the boiler or steam generator need not be divided into two parts B, and C, as shown, but that the boiling water may be allowed to touch or surround the cooking vessel *a*, *a*, the steam and vapour being collected in a still-head or hood, its exit pipe connected to the worm-head *g*, as shown by the dotted lines in fig. 10, of the drawings.

The distilled water, as it comes from the apparatus, is collected in barrels or suitable vessels, and to each twenty-five gallons of the distilled water a small quantity of sulphuric acid (say about a quarter of an ounce) is added with it, and eight or ten ounces of broken charcoal, which is to be left in the water twenty-four hours, and during that time cold atmospheric air is to be blown or forced into it by bellows or other convenient means; the intention being that the charcoal shall remove the disagreeable flavour, or what may be called the vapid or dead taste which distilled water generally has, and the air impart more oxygen to the water, and the sulphuric acid gives it a more agreeable flavour, and makes it taste to the palate more like fresh spring water; the process restoring what may be called its *aeriated or vital* qualities, which it has lost in the operation of distillation.

In conclusion, the Patentee remarks, that the blowing or forcing hot air into the water greatly increases the evaporation thereof, and produces steam more rapidly, and therefore economizes the consumption of fuel, and is applicable to generating steam for working engines for exerting power, warming buildings, drying goods, and various other purposes to which it may be applied.—[*Inrolled in the Rolls Chapel Office, August,* 1836.]

Specification drawn by Messrs. Newton and Berry.

To James Radley, *of Oldham, in the county palatine of Lancaster, gentleman, for his invention of certain improvements in the construction of gauges for indicating or measuring the expansive pressure of steam, or other elastic vapours or gases used expansively as a medium of power.*—[Sealed 4th December, 1835.]

These improvements in the construction of gauges for indicating or measuring the expansive pressure of steam, or elastic vapours or gases used expansively as a medium of power, are principally designed for what are termed high-pressure boilers or generators, and consist in the peculiar construction and novel arrangement of the gauge or apparatus for ascertaining the pressure of the steam or other elastic force, and particularly in the adaptation thereto of an atmosphere or volume of common air, or any other vapour or gas capable of being compressed or reduced in volume, for the purpose of indicating by such compression the expansive force of the steam acting upon it, the medium of communicating such elastic force being an intervening column of mercury or quicksilver. In ordinary high-pressure boilers or generators, where the regulation of the pressure of the steam or other vapour is left entirely to the safety-valve, the incapability of ascertaining the precise pressure is well known; the object, therefore, of this invention, is to obviate that difficulty, and to indicate the pressure of the steam, or other vapour or gases, to almost any extent, and thereby enable the attendant to prevent the accidental explosions which have hitherto arisen in consequence of this defect.

In order to illustrate the invention, and show the apparatus more clearly, we have shown in Plate I., a drawing of one construction of the improved gauge adapted for a steam boiler. Fig. 13, is a vertical section taken through the middle: *a*, and *a**, are two circular chambers, or small cylinders formed of iron or other suitable materials, screwed into or otherwise securely fastened on to a base or foot-piece *b*, *b*, through which a channel or passage *c*, *c*, is made for the purpose of forming a communication between the two cylinders; into the centre of the base a small tube or socket *d*, is screwed, for the purpose of supporting the glass tube *e*, and under this tube another channel *g*, *g*, is made communicating with the passage *c*; in the base the lower parts of all these vessels and passages are occupied with mercury up to the level marked *m*, *m*; near the top of the cylinder *a*, a cock *f*, is inserted, by which steam is to be admitted from the boiler or generator into the cylinder, when the pressure is desired to be ascertained. On the upper end of the other cylinder *a**, there is a chamber *h*, with a cap screwed thereon, supporting a glass tube *i*, properly secured into the upper end of the chamber, and rendered perfectly air-tight; the top of the tube *i*, has a spherical air-chamber *o*. The chamber *h*, is furnished with a small valve *k*, for the admission of air into the chamber, and opposite to it there is a socket *l*, which receives the upper end of the glass tube *e*: the chamber *a*, and *a**, with the communicating passages, are charged with mercury, as said by removing the screw cap from the socket *l*, and pouring the mercury into the glass tube *e*, which, by descending into the chamber *a*, and *a**, will flow to about the level shown. There is a small tube or cylinder piece *x*, screwed into the foot-piece immediately under the chamber *a*, in order to conduct the mercury to the passage *c*, from the centre of the column, and thereby prevent the passage of any condensation of steam which might pass down the sides of the column. On the admission of steam through the cock *f*, the mèrcury will be forced down in the chamber *a*, and rise up into the chamber *h*, and glass tube *i*, *i*, and there indicate the pressure of the steam within the boiler. The scale *n*, *n*, placed behind the tube, or the tube itself being graduated, will show the amount of pressure of the steam upon every square inch. The spherical air-vessel *o*, has a screw plug *p*, for the purpose of increasing or diminishing the capacity of the air-chambers, by means of which plug the volume of air to be compressed may be adjusted to the graduated scale. The valve *k*, is simply employed for the purpose of regulating the air contained in the spaces *h*, *i*, *o*, to the pressure of the external atmosphere, which is done by raising the plug, and thereby opening a small lateral air-channel *q*; and the equilibrium being thus effected, the plug is then screwed down again, previously to which the steam is to be cut off from the gauge, by closing the cock *f*. It will be seen by this arrangement the instrument is perfectly under command, for as often as it may be thought desirable to regulate the gauge, the air occupying the spaces may be adjusted to the proper or atmospheric density; and should it be found, on removing the pressure of the steam, that the mercury does not descend, or stand at its former level in the glass tube *e*, (previously marked), it will be perceived that the air within has varied in density, which may be corrected and adjusted to an equilibrium with the external atmosphere by opening the valve *k*. The glass tube *i*, is made conical, or tapering towards the top, for the purpose of diminishing its capacity, as shown in the drawing; by which arrangement the graduations on the scale may be made equal: whereas if the tube is cylindrical, the degrees must be decreasing in space towards the top, in proportion to the increasing density of the air. It will be evident, when any other elastic vapour than atmospheric air is employed as the volume to be compressed in density by the pressure of the steam, that a reservoir of such gas or vapour must be connected to the valve or passage *k*, to adjust its density, and restore it to its proper equilibrium, as before described, with reference to atmospheric air.

In conclusion, the Patentee remarks, having now explained the nature of my invention, and the manner of carrying the same into effect, I wish it to be understood that I claim as the subject of my invention the peculiar construction and novel arrangement of the steam-gauge above described, and particularly the application of a volume of atmospheric air or other elastic vapour, under any modified variation, capable of being compressed into a smaller volume or greater density by the pressure or force of the steam, or other elastic vapour or gases, contained in the boiler or generator, for the purpose of ascertaining and indicating the pressure or force of such steam or vapour.—[*Inrolled in the Rolls Chapel Office, 4th May,* 1836.]

To JAMES LEEMING, *of Manchester, in the county of Lancaster, worsted spinner, for certain improvements in the construction of water-wheels and of paddle-wheels.*—[Sealed 9th February, 1835.]

THESE improvements in the construction of water-wheels and paddle-wheels, have for their object the regulating or governing the positions of the float-boards in such manner that the resistance of the back water may be diminished, and thereby avoid the loss of power occasioned by such impediment.

Plate I., fig. 14, represents an elevation of one of these improved wheels: *a, a,* are the radial arms, which are, in this case, provided with a slot or goove extending from the centre outwards: in these grooves, the float-boards *b, b,* are mounted, being provided with small anti-friction rollers, to enable them to slide more easily in approaching to, or receding from, the centre of the wheel: *c, c,* is one of two scroll guides or excentric grooves, one of which is to be affixed to each of the sides of the vessel, or walls of the water-course. In the figure, the front one is removed, the better to expose the parts. In this groove, the axles of the float-boards work so, that in the revolution of the wheel they are brought nearer to, or propelled further from, the centre, according to the position of the scroll. By inspecting the figure, it will readily be perceived that as long as the float-boards are in an effective situation, they are propelled to their farthest extent from the centre; but directly they arrive at that point, where, by continuing in their primary position, they would be impeded by lifting the back water, they are withdrawn by the peculiar form of the scroll guide, and retreat from the water without impediment.

The above modification will readily serve for applying the same invention to the paddle-wheels of steam-boats, as no material alteration is necessary.

In conclusion, the Patentee remarks, "Although I have described various well-known parts of machinery in the foregoing specification, I do not claim any such well-known parts separate and distinct as my invention; but I do claim the application of the scroll excentric, or any similar form of excentric to water-wheels and paddle-wheels, for the purpose of receding or drawing the floats, paddles, or boards, towards the centre of such wheels, at such period of the revolution as may be found most desirable to lessen the amount of resistance on leaving the water; and such my invention being, to the best of my knowledge and belief, new, and never before used.—[*Inrolled in the Inrolment Office, August,* 1835.]

To WILLIAM WESTLEY RICHARDS, *of Birmingham, in the county of Warwick, gun-maker, for his invention of certain improvements in primers for discharging fire-arms by means of percussion.*—[Sealed 22nd March, 1836.]

THIS invention of certain improvements in primers for discharging fire-arms by means of percussion, applies to that kind or description of percussion primers commonly called copper caps, or those in which the detonating powder or priming is contained in a copper cap or metal shell or case, and have for their object the transferring or removal of the explosion or discharge of the percussion or detonating powder, whereby the necessity of deep projecting rims or shields round the cavity of the cock is obviated, as no part of the metal cap, case, or shell of these improved primers can be projected from the nipple in firing, and the liability of the head of the cock being broken by the explosion of the priming (which frequently happens with the common copper cap) is also obviated. And another object of these improvements is the making of the primers much larger than the ordinary copper caps, so as to be more readily handled, and easily affixed to the piece; at the same time they are equally impervious to wet, and better adapted for naval and military purposes than the ordinary copper caps, or other percussion primers, hitherto adapted for such purposes.

These improvements consist, first, in removing or transferring the percussion or detonating powder or priming from immediate contact with the inside of the head or top of the copper cap or primer, and placing it nearer to the mouth thereof, so that the explosion or firing of the detonating priming shall not take place at the bottom of the interior or cup of the cap, but nearer to its mouth, whereby the fuse arising from the explosion of the detonating powder will have free vent or escape, and the explosion will only distend or partly open the sides of the cap or primer. The space between the ordinary or old position of the priming or detonating powder, and its position in my improved primers, being occupied by a piece of hard metal. And, secondly, these improvements consist in protecting the copper cap or metal case or shell of the primer, and preventing the possibility of its bursting, and any part or portion thereof being projected or thrown from the nipple on the discharge of the piece, by encompassing it with a second cap, case, or shield, placed around the former, and preventing the expansion or destruction of the sides thereof beyond a certain or given distance.

And as there are many different ways of carrying these improvements into effect, the Patentee has described several different methods of constructing these improved primers; but does not mean or intend to confine himself to the exact form and dimensions therein shown, or to the precise mode of constructing the same, as they may be varied to suit different kinds or descriptions of primers for various purposes.

Fig. 15, Plate I., is an enlarged vertical section of a copper cap of the ordinary construction as in common use, which will serve to illustrate the objects of the improvements: *a*, is the top of the cap; *b*, the sides thereof; *c*, the ordinary position of the detonating or priming powder. The dotted lines show the direction of the fuse and force of explosion on the discharge of the priming, and the cause of the cap bursting and flying off in pieces. Fig. 16, is a similar section of an ordinary copper cap, which will serve to illustrate the first part of the improvements, it being applied thereto, viz. the novel position of the priming. The percussion or detonating powder being removed from the top of the cap into its novel position nearer to the mouth thereof; *a*, is the top of the cap; *b*, the sides; *c*, the position of the priming or detonating powder; the dotted lines, as before, showing the direction of the force of explosion, whereby it will be seen that the metal cap, case, or shell, will be opened and distended only in a small degree, and not likely to be burst to pieces, as in the former, the space between *a*, and *c*, being occupied by a piece of any kind of hard metal *d*, soldered or otherwise fastened into the cap. Fig. 17, is a section to exhibit another mode of effecting the same object, viz. by placing the priming material into a shallow copper cap or dish fixed on to the end of a piece of hard metal: *a*, *b*, is the cap; *c*, the priming; *d*, the piece of metal.

Figs. 18, and 19, are sectional representations of two other constructions of the improved primer: *a*, *b*, the metal cap, case, or shell, which surrounds the hard metal pin *d*, and is fixed to it by pressure, or in any convenient manner; the metal pin *d*, in these instances, extending through the cap or shell *c*, is the position of the priming or detonating powder. Figs. 20, 21, and 22, are elevations and sections of two of the improved primers, with the *second* part of the invention applied thereto, viz. the improved method of further protecting the detonating or percussion primers, by an outer cap, casing, or shield, surrounding or encompassing the cap, case, or shell, containing the detonating powder; which improved primers are preferred for fowling-pieces or sportsmen's use: *a*, *b*, is the inner metal cap, case, or shell, which surrounds the detonating or priming powder placed at c. The piece or pin of hard metal *d*, is placed within the top part of the outer or safety case, cap, or shield, *e*, *e*, which extends down over the cap or shell *a*, *b*, leaving a small space around and between it and the inner cap, as shown more particularly in fig. 22, which is a representation of the cap, as looking towards the mouth. On the ignition of the detonating powder, the sides *b*, of the case or shell *a*, will be forced open and distended, but will be prevented from bursting or flipping off, by the outer case or shield *e*, which arrests the sides *b*, of the case *a*, and stops their further progress or extension outwards, as shown in fig. 23, which is a representation of one of these improved primers, looking towards the mouth after being discharged: hence it will be seen, that by the aid of the improvements, the possibility of accidents from pieces of the copper cap or primer being projected, or flying off the nipple on the discharge, is prevented. Fig. 24, is a section of the kind of primer intended for naval and military use: *d*, is the hard metal pin. The cap, case, or shell, *b*, in this instance, is a cylinder of copper, tin, or other metal; the pin *d*, passing partly through it. The cylinder is secured to the metal pin in any convenient manner, as by a rim, or circular piece of tin, or other metal, *f*, passed over it, and serves to enlarge the primer, so that it can be easily handled.

It may here be observed, that these solid metal primers cannot be exploded by treading on them, or by any blow struck on the sides of them; which objection has been made to the use of copper caps on board of ships, where they are liable to be dropped upon the deck.

In conclusion, the Patentee remarks, having now particularly described and ascertained the nature of my improvements, and manner of carrying them into effect, I wish it to be understood that I do not intend to confine myself to any particular metal or materials of which the primers may be made, or to the precise form or construction herein shown, or to any particular process of manufacturing the same, as the different parts may be formed and combined by hand, or by machinery, as most desirable; but what I claim as my invention is, first, the novel position of the detonating or priming powder, it being transferred, removed, or transposed from the head or top part of the cap, and situated or placed nearer to the mouth of the cap or primer, as above described. And, secondly, the protecting, encompassing, or enclosing the metal cap, case, or shell, containing the said detonating or priming powder by a second case, cap, or shield, in order to prevent the flying off of pieces or parts of the inner cap, on the discharge of the piece, and for the prevention of the fracture or breakage of the cock-head.—[*Inrolled in the Rolls Chapel Office, September,* 1836.]

Specification drawn by Messrs. Newton and Berry.

To Miles Berry, *of* 66, *Chancery-lane, in the parish of St. Andrew, Holborn, and county of Middlesex, engineer and mechanical draftsman, for his invention of certain improvements in machinery or apparatus for shaping and forming metal into bolts, rivets, nails, and other articles; parts of which improvements are also applicable to other useful purposes, being a communication from a certain foreigner residing abroad.*—[Sealed 19th February, 1834.]

These improvements in machinery or apparatus for shaping and forming metal into bolts, rivets, nails, and other articles, consist in the improved arrangement and construction of the working parts of several different machines applicable to the shaping or forming of metal rods or wire into bolts, pins, rivets, nails, spikes, screw blanks, and such other kind of articles; that is to say, these machines are capable of cutting off portions of such rods or wire, and heading or shaping them into the desired form, and are intended to operate upon the metal either hot or cold, as circumstances may require: several of which machines are somewhat alike in their general construction, arrangement, and operation, although differing in the detail of the working parts; and as it is impossible to construct machines of this description without using some parts which are not new, and have been before used in machines of a similar nature, the Patentee states, "I wish it to be understood that I lay no claim to the exclusive use of any of the several parts of the machines separately (unless hereinafter particularly stated), but only to the general construction and arrangement of the machines as described, and to the application of the several parts of the same. The first machine I shall describe, is exhibited in the several figures in Plate II., and is intended to shape or form bolts, rivets, nails, screw blanks, or such other articles, out of rods of metal or lengths of wire, and consists of a feeding apparatus by which the length of rod or wire is successively brought into the machine, and introduced into a pair of holding chaps and heading dies, which close upon the end of the wire or rod, and cut off the required length to form the bolt, rivet, or screw blank, and afterwards bring it opposite the end of a heading punch, which is moved forward by toggle joints and cams, and compresses the end of the wire into the recess in the dies, and thereby forming the head of the bolt, rivet, or screw blank; and after effecting this object, the heading punch is drawn back by the action of the toggle joints and cams: the holding chaps then move back to their former position, and open, to allow of the now headed bolt or rivet being removed, and a fresh part of the rod or wire introduced between them by the feeding apparatus; after which, the other parts of the machine go through a succession of operations as before: by these means, the metal rods or wire are cut into lengths, and headed so as to form bolts, rivets, pins, screw blanks, and such kind of articles, the shape of the heading dies being formed to suit the various shapes required on the article to be manufactured.

Fig. 1, is a plan view of the machine; fig. 2, is a side elevation; fig. 3, is a vertical section, taken longitudinally through the machine; and fig. 4, is a similar section, taken at the dotted lines A, B, in fig. 1, and showing the holding chaps and heading dies open to receive the rod or wire to be operated upon. Fig. 5, is another section, showing the chaps and dies closed upon the wire, and in the position they are in after having cut off a portion of the rod, and are moved upwards opposite the end of the heading punch:

a, a, is the framework of the machine, of wood or iron; *b,* is the main shaft, turning or bearing on the framework, and carrying the cams that actuate the different parts of the machine, and which shaft receives its motion from a steam-engine, or other first mover, by toothed wheels, or a band passed over a rigger or pulleys on its end; *c, c,* are the toggle joints which move the heading punch; one of these toggle joints is connected to the cross head *d,* and the other to the punch *e,* working in a guide box *f,* mounted upon cross bars: the holding chaps *g,* and heading dies *h,* are mounted in the box or case *i,* also placed upon a cross bar: *k, k,* are strong rods or tubes of iron, secured at one end to the cross head *d,* and at the other ends to the cross head *l,* at the back of the box *i;* between these cross heads, the main strain of the machine is sustained by the rods *k,* while the heading is performed. The end of the length of rod or wire *m, m,* is first passed between guide rollers 1, 2, 3, which also assist in straightening the wire before being carried into the dies; it is next passed between wedges 4, 4, mounted in the pieces 5, 5, upon the cross bar; these pieces have adjusting screws fitting against the wedges, which are used as safety holders to prevent the rod being drawn back by the feeding tongs on their return to bring into the machine a fresh part of it. The wedges should press but with a very slight friction on the wire when it is being drawn into the machine, but upon any movement backwards, they immediately tighten upon the wire and prevent its return. The rod or wire is next passed through the feeding tongs or apparatus 6, 6, and thence through the cross head *l,* and box *i,* into the heading dies *h.* The feeding apparatus consists of a pair of levers *n, n,* mounted upon pins 7, 7, as their fulcrums, fixed into the sliding pieces 8, 8, which move in guides 9, 9. To the outer end of the levers *n, n,* are connected the bent sliding bars 10, 10, moving in bearings 11, 11: upon the lower part of these sliding bars are placed adjustable tappets 12, 12, actuated by cams or wipers 13, 13, upon the main shaft *b*, which cams or wipers, as the shaft revolves, come in contact with the tappets 12, 12, and force them back, at the same time moving the sliding bars 10, 10; thereby causing the levers *n′*, *n*, to make the tongs 6, 6, take fast hold of the rod or wire, the further movement of the sliding bars causes the feeding apparatus to move forward upon the guides 9, 9, and carry into the dies the quantity of wire required for one operation. There is a lengthwise adjustment shown on the sliding bars 14, 14. The wire or rod being thus brought into the machine, the heading dies and holding chaps immediately close upon it, when the wipers 13, 13, cease to operate upon the tappets 12, 12; the sliding bars and feeding apparatus are then at liberty to move back into their former position, ready to bring forward another portion of wire, which may be effected by the springs 15, 15, connected to the feeding apparatus, or in any other manner: on the return of the pieces 8, 8, they come in contact with the ends of the wedges 4, 4, and tighten them upon the wire during the time the feeding apparatus has not hold of it. On the end of the rod or wire being brought into the heading dies (and projecting a proper distance through them to form the head of the bolt, rivet, or screw blank), the holding chaps immediately close, and cause the heading dies to take fast hold of the wire; this movement is effected by the levers *o*, *o*, turning horizontally upon pins 16, 16, fixed in a cross bar of the machine; one end of each of these levers is formed into slots, through which the lower ends of the legs of the holding tongs are passed, the reverse ends of them being connected together by a hinge joint and pin at 17, which pin also serves as a guide, working in slots in the case *i*. The other ends of the levers *o*, *o*, work in the groove of the cams *p*, *p*; by the rotation of which they are alternately moved outward and inward, and open and close the holding tongs. As soon as the cams *p*, *p*, have extended the ends of the levers *o*, *o*, and closed the dies, the cam *q*, comes into operation upon the upper side of the longer arm of the lever *r*, which is mounted upon a pin 18; the other end of the lever *r*, works in a slot in the bar *s*, which bar passes through loops on the ends of the legs of the holding tongs. As the cam *q*, revolves, it depresses the longer end of the lever *r*, and raises the other, and with it the cross bar *s*; and at the same time raises the holding dies into the position shown in fig. 5, that is, opposite to the end of the heading punch *e*; at the same time, the back part of the heading dies cuts off the required length of wire or rod to form the bolt, rivet, or screw blank. There is a hardened steel plate, 19, fixed into the case *i*, which holds the wire as the dies are rising, and acts as a counter blade or cutter. While the dies are carrying the piece of rod opposite to the heading punch, the cam *t*, comes into operation upon the piece *u*, suspended from the toggle joints, and raises them into a nearly straight line, thereby forcing the punch forward, and compressing the projecting end of the wire into the cup or recess of the dies, and forms the head of the bolt, rivet, or screw blank; and as soon as this is performed, the cam *t*, ceases to act upon the piece *u*, and the toggle joints or levers are free to fall down into their former position, which may be accelerated by weights or springs. As soon as the heading punch has ceased to act upon the wire, the cam *v*, comes into operation upon the lever *w*, and raising the longer end depresses the shorter, and with it the bar *s*, and the holding tongs and heading dies, when the inclined grooves of the cams *p*, *p*, will cause the levers *o*, *o*, to collapse, and open the legs *g*, *g*, (as shown in fig. 4,) thereby allowing the now headed bolt, pin, rivet, or screw blank, to fall away below, when a fresh portion of the rod or wire will be brought into the dies, and the same operation performed as before. In order to keep the dies tightly closed during the time the heading of the wire is performed, there are two inclined planes *x*, *x*, formed on the holding tongs, which, as they rise, come into contact with the inclined end of the pieces *y*, *y*, suspended by pins within the case *i*, and adjustable by the screws *z*, *z*. There is a bridle piece 20, extending from the framework to the piece *u*, in order to keep it in its proper position with the cam *t*: 21, is a stop piece or rest for the toggle joints; 22, are the bridle or coupling pieces to keep the toggle joints to the cross head *d*, and the punch *e*; 23, 23, are adjusting screws for the bearings of the punch *e*, and which is also capable of adjustment lengthwise. I would remark that, in order to head bolts, pins, rivets, or screw blanks, of different lengths in these machines, different sized heading dies must be put into the holding chaps, and different lengths of wire brought into them: this is done by the adjustment of the tappets 12, and the adjustment chap 14, on the sliding bars 9, 9; and also, that, in this case, the heading punch must be capable of adjustment lengthwise, which may be done by lengthening or shortening its smaller end.

The next machine I shall describe, is of a more simple construction than the foregoing, and is intended to make bolts, rivets, pins, and screw blanks of a larger size; and as the movements of nearly all the operative parts are the same in the foregoing machine, I shall use the same letters of reference to denote similar parts as in the former, and therefore refer to the foregoing description for the further illustration of this drawing. In this machine, the main shaft *b*, is placed under the holding tongs and heading dies, and has a pair of double grooved cams *p*, *p*, into which the legs *g*, of the tongs work, and which cams give all the movements to the holding tongs and dies, instead of the levers *o*, *o*, *v*, and *w*, and cams *p*, *p*, *q*, and *v*, in the former machine; and the toggle joints *c*, *c*, are actuated by a long lever, instead of the piece *u*.

Fig. 6, is a side elevation; fig. 7, is a section showing the different parts of the machine in the positions they are in after the dies have cut off the required length of rod, and carried it opposite the end of the punch *e*; and when the toggle joints are forced up by the lever, and the punch *e*, is in the act of heading the bolt, rivet, or screw blank. Fig. 8, is a transverse section of the machine in this position. Fig. 9, is a plan view, with the heading parts shown in section. There is not any feeding apparatus shown connected to this machine, as the rod or wire may be fed into the dies by hand or by a similar apparatus as that described in fig. 1, or in any other convenient manner. The legs *g*, *g*, of the holding tongs work in the grooves *o*, *o*, of the double cams *p*, *p*. These grooves have inclined planes *o**, *o**, in them, which, as the cams revolve, alternately open and close the tongs and dies, as shown in the section, fig. 8. These cams *p*, *p*, have also excentric grooves *q*, and *v*, in them, (see fig. 7,) in which the studs *w*, *w*, upon the ends of the legs *g*, *g*, work; and as the cams revolve, these grooves alternately raise and lower the heading tongs and dies: *u*, is a long lever attached to one of the toggle joints *c*, which is worked by the cam *t*, and raises the lever, and with it the toggle joints *c*, *c*, and forces forward the punch *e*, and performs the heading of the bolt, rivet, pin, or screw blank, as before described; and after the cam *v*, has ceased to act upon the end of the lever *u*, the toggle joints are free to be brought down into their former position, ready for the next operation.

The next machine is somewhat like that first described in its operative parts, but the levers which give the movements to the toggle joints, and holding chaps, and heading dies, have yokes or straps on the ends which embrace their several cams or tappets; and the holding tongs and heading dies, instead of rising upwards to carry the portion of wire or rod opposite the end of the heading punch, move sideways after cutting it off the length; and the feeding apparatus shown in this machine, is also different from that first described; but the same, or any other apparatus which will bring the required portion of the wire or rod into the dies, may be adapted to this or the other machines.

Figs. 10, and 11, are representations of an apparatus or machine for forming small rivets or pins, and consist of a lever which gives the motions for cutting off the portion of wire or rod for the rivet, and afterwards compressing the end to form the head. This machine may be fed by hand, or other means. Fig. 10, is a plan view, with the heading dies shown in section, and open, after having formed a rivet. Fig. 11, is a similar view, with the dies and punch closed upon the portion of wire or rod after having cut it off the length, and when in the act of forming the head: *a*, *a*, is a metal plate or frame upon which the different parts are mounted; *b*, is a lever, which may be worked by hand or other means, having its fulcrum on the pin *c*; *d*, is one half of the heading dies, secured on the plate *a*, by bolts, and is adjustable as regards its position to the heading punch by the screw *e*; *f*, is the other half of the heading dies, which slides upon the plate *a*, and is kept in its proper position by guide pins *g*, *g*; *h*, is a projecting piece on the sliding part of the dies, having an inclined plane, which is acted upon by another inclined plane on the projecting part *i*, of the lever, as it is moved inwards, thereby forcing the part *f*, to slide towards the other part *d*, of the dies, and at the same time cut off the required portion of the rod or wire *k*, which is introduced through a hole in the plate *a*. As the lever *b*, is moved inwards, it forces the heading punch *l*, which slides in the guide box *m*, on to the end of the portion of rod or wire, and compresses it so as to form the head. As soon as this is effected, the lever *b*, is moved outwards to its former position, when the bridle piece *t*, which connects the parts *h*, and *i*, together, will draw back the part *f*, of the dies, and open them, when the headed pin or rivet can be removed, and a fresh portion of the rod or wire introduced into the dies. At the same time the bridle piece *n*, which connects the lever *b*, to the punch *l*, will return the punch ready for another operation. In this machine the recess for forming the shape of the head is made on the end of the punch instead of in the dies; but it may be made differently, if thought desirable. It will be seen by fig. 11, that the peculiar shape of the parts *h*, and *i*, will keep the dies closed during the operation of heading, and prevent them springing open. I would remark, that there may be a small spring tappet adapted to this machine, which may be moved by the lever, and made to knock out the headed pin or rivet from the dies as soon as they are opened.

Having described these improved machines or apparatus for shaping metal into bolts, pins, rivets, screw blanks, and such other articles, I shall proceed to describe another machine, which is intended to be used in shaping or forming metal rods or wire into spikes, nails, or such other articles, and consists of two indented swedging rollers, which, as they revolve, give to the metal the required form for two sides of the spike or nail as the rod passes between them. In connexion with the swedging rollers there are two large discs or wheels, the peripheries of which work against the sides of the small rollers, and keep the metal between them, and at the same time giving it the required shape for the other sides of the nail or spike. Fig. 12, is a plan or horizontal view of the machine; fig. 13, is a side elevation; and fig. 14, a vertical section taken in the middle of the machine: *a, a,* is the metal framework or standards carrying the several bearings of the shafts, wheels, and pinions, and is connected together by screw bolts; *b, b,* are the indented or swedging rollers, (seen best in fig. 14,) fixed on the shafts *c,* and *d,* which receive their rotary motion from any first mover; *e,* is a toothed pinion fixed on the shaft *c,* gearing into another pinion *f,* on the shaft *d*; *g,* and *h,* are the large wheels or discs, the peripheries of which are turned perfectly smooth, and run in contact with the sides of the indented rollers *b, b,* at their peripheries. The wheels or discs *g, h,* receive their rotary motion from the bevelled pinions *i, k,* fixed on the shafts *c,* and *d,* taking into gear with the bevelled wheels *l,* and *m,* fixed on the sides of the discs. The metal rod or wire is passed downwards between the swedging rollers *b, b,* and the discs *g, h*; and as they revolve, the rod or wire becomes indented, and passes from them in the form of spike nails, as shown in fig. 14. The shaping of spike nails, screw blanks, and such other articles by indented or swedging rollers, has often been done before; I therefore wish it to be understood, that the only features of novelty which I claim in this machine, are, first, the application of the large discs or wheels to such indented or swedging rollers; and I should remark, that these discs should be at least three to four times the diameter of the swedging rollers; and, secondly, the general arrangement and construction of this machine, as herein shown and described.

Having described these improvements in machinery or apparatus for shaping and forming metal into bolts, rivets, nails, and other articles, I need only remark, that parts of these improved machines or apparatus may be applicable to various other useful purposes; for instance, some of these improved machines may be made capable of shaping or forming tenter hooks, or such other articles, and that presses for punching holes in boiler plates, or for cutting out collars, washers, or button blanks, may be constructed after the manner of these machines; but I do not claim such application as part of this invention.—[*Inrolled in the Rolls Chapel Office, August,* 1834.]

Specification drawn by Messrs. Newton and Berry.

To William Simpson Potter, *of Verulam-buildings, in the county of Middlesex, merchant, for certain improvements in rendering fabrics water-proof.*—[Sealed 28th April, 1835.]

For the description of the subject of the above patent right, we beg to present our readers with the following specification of the Patentee.

Take half an ounce of isinglass (Russian is preferred), put it into one pound of rain or soft water, and boil it until dissolved; take one ounce of alum, put it into two pounds of water, and boil it till dissolved; take a quarter of an ounce of soap (white soap is preferred), with one pound of rain or soft water, and boil it till it is dissolved; after each of these ingredients have been separately dissolved, strain them separately through a piece of linen, afterwards mix them together in a pot, put it on the fire again till it simmers, then take it off, and, while thus near boiling, dip a brush into it, and apply the liquid it absorbs to the wrong or reverse side of the cloth intended to be made water-proof. The cloth must be spread out upon a table during the operation, and remain there until it is dry; and after it is dry, it must be brushed on the wrong side against the grain; and then, dipping the brush in clean water, pass it lightly over, and leave it till it is again dry. After that, the gloss caused by the application of the ingredients can be taken off. Three days after the operation has been done, in the manner just described, the cloth will be impervious to water but not to air.

For light fabrics, as linen, cotton, silk, or other stuffs, a difference in the relative quantities of the ingredients and an addition is necessary, as follows:—Take a quarter of an ounce of isinglass, put it into half a pound of rain water, boil it till dissolved; take three ounces of alum, put it into three pounds of rain water, and boil it till dissolved; take half an ounce of soap or saponaceous compound, dissolved by degrees in an ounce and a half of oil (essence is better) of turpentine, and add, little by little, one pound and a half of water, until perfect dissolution of the soap; take one ounce of the finest glue (German glue I have found to answer best), put it into one pound of rain water, and boil it till dissolved; take one ounce of Arabian gum, put into half a pound of rain water, and boil it till dissolved. After each of these ingredients has been separately dissolved, strain them separately through a piece of linen; afterwards mix the alum with the isinglass, glue, and gum, and ten minutes after add the soap or saponaceous compound. The ingredients must be hot when they are mixed together. When they have cooled a little (half cold), take the stuff you intend to be made water-proof, and steep it once or twice in the ingredients till you see that it is well and equally wet or moistened; afterwards wring it and spread it out horizontally upon a table or on turf; and when it is well dried, steep it again in rain or soft water, or in a tub of rain or soft water, lightly soaped or alumed (mixed with alum), and dry it in the same manner on table or turf. When this is done, press the stuff with hot or cold press. This operation of pressing stuffs, or of the unglossing of cloth, requires practice, in order to obtain knowledge of the operation; but no particular description can be given, though requisite judgment will be obtained by a few trials.

The same remark applies to the steeping the stuffs in alumed or soaped water, which depends upon the colour and the quality of the stuff. If the stuff is of a colour liable to injure by heat, it must be steeped in cold ingredients, or it would be better that the application should be in the same manner as applied to cloth.

For paper, cartridge paper, paste and mill boards, brown paper and other like fabrics, the same quantities and qualities of ingredients must be used as that before given for cloths; and to render the paper water-proof, it must be taken sheet by sheet and steeped in the ingredients, which must be either hot or cold, according to the more or less absorbing quality of the paper; if it is of a less absorbing quality, it must be steeped in hot ingredients; or if it is of a quality that absorbs much, it must be steeped in cold ingredients; after that it is dried in the air in the same manner as by the manufacturers.

Having thus described and ascertained the nature of the invention, and the manner of carrying the same into effect, I would wish it to be understood that although I have given precise quantities of the materials used, and the manner of applying the same, which I conceive best, and have found generally to answer, yet it may be found under some circumstances desirable slightly to vary the same, I do not therefore confine my claim to the quantities, or the exact manner of applying the materials, provided the essential properties of the invention be retained.—[*Inrolled* 28*th October*, 1835.]

To Nathaniel Partridge, *of Elm-cottage, near Stroud, in the county of Gloucester, gentleman, for his invention of the application of a certain composition, paste, or materials, as an anti-attrition, applicable to the bearings of wheels and machinery generally.*—[Sealed 7th December, 1835.]

This invention of the application of a certain composition, paste, or materials, as an anti-attrition, applicable to the bearings of wheels and machinery generally, consists in the application of a certain composition formed principally by a commixture of oil and solution of lime in water, whereby a sort of paste or composition is obtained, applicable as an anti-attrition to the lubrication of bearings of axletrees of wheels, and of shafts, axles, and machinery generally. The formation of the composition is described by the Patentee in the following manner:—

First, to obtain the solution of lime in water: to about twenty gallons of clear soft water apply three or four pounds of fresh lime; put them into a cask, and stir them well about; then let it stand about twenty-four hours, or until the water is quite clear, when it may be drawn off as wanted. The lime-water should be stirred up every five or six days, that the water may be kept fully impregnated with the lime. To one part or proportion of this solution of lime-water, add one part or proportion of olive oil. These ingredients are to be placed in an open vessel, and whisked, beat, or stirred well together, until they are completely blended; or they may be placed in a bottle or jar, and well shaken, until the same effect takes place. The composition of lime-water and oil will then have the consistency and appearance of thick cream; and if the composition made from the above proportions should be found too thick, it may be thinned or reduced in consistency by adding a little more oil; and I would remark, that the composition should be well shaken or mixed up before using; and the lime-water should be kept free from air, and as cool as possible.

For axletrees and other bearings this composition will be found superior to pure oil, and will not be consumed so rapidly.

To render this composition more applicable to the lubrication of cogs or teeth of wheels, I prefer whale or other common oil, which may be used in one part or proportion to two parts or proportions of lime-water; and when perfectly commixed, as before stated, to it is to be added palm oil or tallow, or both, and well rubbed or ground therewith until the composition assumes the appearance of thick paste, when a small quantity of carbonaceous matter, such as plumbago, black-lead, or soot, may be added, and, when incorporated with each other, the composition will be fit for use.

Having now explained the nature of my invention, and the manner of carrying it into effect, I wish it to be understood that I claim as my invention, secured to me by the above in part recited letters patent, the application and use of the composition, paste, or materials formed of lime-water and oil, as above stated, as an anti-attrition, for the purpose of lubricating bearings of axletrees, wheels, and machinery generally.—[*Inrolled in the Rolls Chapel Office, May,* 1836.]

To **Edward Jelowicki,** *of No.* 8, *Seymour-place, Bryanston-square, in the county of Middlesex, Esq., for an invention of certain improvements in steam-engines, being a communication from a foreigner residing abroad.*—[Sealed 10th February, 1836.]

This invention of certain improvements in steam-engines apply to that kind or description of engine in which the cylinder is moveable, or made to slide up and down a hollow piston rod, such rod serving for the induction and eduction passages for the steam; and consists, first, in a novel construction of such kind of steam-engine in which the cylinder reciprocates upon a moveable or oscillating hollow piston rod, whereby the expansive force of the steam is transmitted direct from the engine to the crank or driving shaft, without the interposition of ordinary jointed connecting rods, cross heads, or other parts; and, second, in another improved construction of the same kind of engine, with the cylinder working upon two oscillating hollow piston rods; and, third, in an improved construction of engine of the same description, the cylinder reciprocating upon two fixed hollow piston rods.

The Patentee here remarks, "I am aware engines of the above kind or description have been heretofore made, but they have been constructed with the cylinder reciprocating upon a fixed hollow piston rod passing through both its ends, and the power of the engine transmitted to the crank shaft by jointed connecting rods, cross heads and other parts which are dispensed with in my improved construction of steam-engines, excepting when a rotary motion is required to be obtained from the third improved construction; then a jointed connecting rod is necessary to transmit the power from the engine to the crank or driving shaft; but when it is used for pumping liquids, sawing stone or wood, it is not required. And further, in these improved construction of engines the hollow piston rods do not pass through both ends of the cylinder.

Fig. 1, Plate III., is a side elevation of the first of these improved construction of engines, one of the side frames being removed, the better to show the parts. Fig. 2, is a transverse section of the same : *a*, *a*, is the framework or standards upon which the driving or crank shaft *b*, with its fly-wheel, is mounted in proper bearings; *c*, is the cylinder of the engine, connected to the crank *d*, by the rod *e*, which is firmly secured at one of its ends to the cap or cover of the cylinder, and at its other end is attached in the usual manner of forming such connexions to the crank *g*, is the hollow piston rod properly mounted at one end, in the bearings or stuffing boxes *h*, *h*, and at the other is firmly secured to the piston *i*, by the conical end of the rod fitting into a conical recess in the piston, and fastened by a screw and nut, or in any other convenient manner. Fig. 3, is a section of the piston and its hollow rod detached, and drawn on an enlarged scale, the better to show the construction. The hollow piston rod is divided longitudinally into two ways or channels; one for the induction passage of the steam to the cylinder, and the other for the eduction or escape of the steam, after exerting its force in the engine to the atmosphere or to the condenser, as the engine is worked either with high pressure steam, or as a condensing engine. The induction and eduction valves are contained in the piston itself, and are shown detached in section at A, B, fig. 3: the one A, is the induction, for the admission of the steam into the cylinder on either side of the piston, and consists of a hollow tube open at both ends, but divided by a partition *k*, in the middle, and has two openings *l*, *m*, formed in its sides, one above and another below the partition, as will be seen by the drawing. These openings *l*, and *m*, are placed alternately opposite the induction passage *n*, of the piston, as the steam is entering the cylinder above or below it. The eduction valves B, are solid plugs *o*, and *p*, connected together by a rod *q*, and are made to fit properly into the ends of the exit passages *r*, *r*, of the piston. The end of the hollow piston rod at *h*, *h*, is T-shaped, the arms being connected by proper stuffing boxes, or steam-tight joints in the bearings *h*, *h*; one to the steam pipe *s*, leading from the boiler, and the other from the exit pipe *t*, leading to the condenser or atmosphere. The action of the engine is as follows:—Steam being admitted from the boiler by the pipe *s*, into the hollow piston rod; and passing along the channel or way *u*, (as shown by the arrows,) enters the cylinder by the openings *n*, and *m*, (the parts being situated as shown in the drawing,) and exerting its expansive force between the upper sides of the piston and the cover *f*, the cylinder is made to move along the piston rod, and transmits the force of the steam through the rod *e*, to the crank *d*, and, consequently, turns the driving shaft round, the T-shaped ends of the piston rod turning a small distance in the bearings or stuffing boxes *h*, and allowing the piston rod and cylinder to oscillate and keep at all times in a direct line with the pin or centre of the crank. When the cylinder has moved near to the end of its stroke, the valves A, B, will come into contact with the inside of the end or cover *v*, of the cylinder, whereby they will be changed simultaneously, the induction passage *m*, of the valve A, being passed away from opposite the opening *n*, of the piston, while the other induction opening *l*, of the valve, will be brought opposite the opening *n*, and the steam admitted into the cylinder upon the reverse side of the piston. At the same time the eduction pipe *o*, will be closed, and the other *p*, opened, which will allow the steam contained in the cylinder between the piston and the cover *f*, to escape. After this change of the valves the cylinder begins immediately to move the reverse way, and on the valves meeting with the cap or cover *f*, they are again changed, and so on, the fly-wheel carrying the crank over the dead points or centres, and thereby keeping up a continuous rotatory motion, as in reciprocating engines of the common construction."

Having described the simple construction of a single engine, the Patentee refers to representations of a double engine, in which the two cylinders act upon the crank, and produce a continuous rotatory motion without the aid of a fly-wheel, the cylinders assisting each other over the dead points of the crank, as is well understood by all engineers.

The second improved construction is an engine with two oscillating or moveable hollow piston rods, instead of the one divided into two compartments, as first described. These rods are simple tubes, one serving for the induction of the steam to the engine, and the other as the eduction therefrom.

Fig. 4, is an enlarged section of the piston and its rods detached, the other parts and action of the engine being the same as before described. It will not be necessary further to describe it, but proceed to the third improved construction of engine, viz. with two fixed hollow piston rods. In this instance the piston rods are not allowed to oscillate or move out of their proper direction, and the cylinder is retained in its proper motion by ears on its sides, carrying anti-friction rollers moving in slots, or a parallel motion, and the rod *c*, becomes a connecting or ordinary crank rod, being jointed to the end or cap *f*, of the cylinder, instead of being fixed thereto.

The Patentee here remarks, "I have shown the driving shaft and fly-wheel as situated above the engine, because in this position a greater area of the piston is given to raise or lift the weight of the cylinder, the space occupied by the piston rod on the other side decreasing its area, which has the weight of the cylinder in its favour in descending; but the position of the engine may be reversed, as, for instance, when applied to the pumping of liquids without the application of a crank or fly-wheel, as above noticed; and, further, that the admission of steam may be cut off at any part of the stroke of the engine required, so as to work the steam expansively by making the valves A, B, longer or shorter, so as to come in contact with the ends of the cylinder sooner or later, as the case may be: and, further, I would remark, that instead of constructing the hollow piston rods of two tubes placed side by side, as above described, they may be placed one within the other, as shown in the detached sectional figures; the interior one for the induction or steam way, and the outer for the exit or waste steam, or *vice versa;* and further, that the induction and eduction valves may, if thought desirable, be placed in connexion with the steam and eduction pipes near the bearings or stuffing boxes *h, h*, instead of in the piston, and be worked in any convenient manner from the engine, but I prefer the method above described.

Having now described the nature of this invention, and the manner of carrying the same into effect, I wish it to be understood that I do not mean or intend to confine myself to any particular dimensions or forms of the parts of the engine shown in the drawings; neither do I claim as new any of the parts separately, nor the construction of steam-engines with the cylinder reciprocating upon a fixed hollow piston rod, but I claim as this invention the construction of steam-engines as first above described, that is to say, with the cylinder sliding or reciprocating upon a moveable or oscillating hollow piston rod; also the improved construction of steam-engines second above described, that is, with the cylinder reciprocating upon two hollow moveable or oscillating piston rods; and further, the improved construction of steam engines last above described, with the cylinder reciprocating upon two fixed hollow piston rods passing through only one end of the cylinder, as above described."—[*Inrolled in the Rolls Chapel Office, August*, 1836.]

Specification drawn by Messrs. Newton and Berry.

To HENRY WALKER WOOD, *of Austin-friars, in the city of London, merchant, for an improvement in obtaining certain oils.*—[Sealed 18th March, 1835.]

THIS invention is applicable to the process of obtaining such oils as are produced from seeds. In obtaining oils from seeds, according to the ordinary means now resorted to, it is usual to submit the seed to bruising and grinding, and subsequently to considerable pressure, in order to express the oil therefrom, all which is well understood. The object of the invention secured by the present letters patent is in the progress of such process, to apply diluted acid (muriatic acid in preference) previously to pressure, whereby the seed will part more thoroughly with the oil. Having thus stated the object of the invention, we shall describe the process as pursued, in order to apply the improvement before-mentioned.

To about one hundred pounds of seeds during the time that it is being ground, sprinkle over it regularly about three pounds of muriatic acid, diluted with about six pounds and a quarter of water; this is supposing the acid to be of 1160 specific gravity.

By the process of grinding and sprinkling, the diluted acid will be intimately mixed with the ground seed. This mixture of seed, acid, and water, is to be permitted to stand for some hours: the Patentee remarks, twelve will be generally found sufficient, though the time will vary, depending on the quality of the seeds; but this will be soon ascertained by practice, and a short time longer or shorter will not materially influence the process. The mixture is next to be submitted to pressure by placing it in bags, and disposing the same in the press, first with a bag of seed, next a plate of iron, then a bag of seed, and so on. An hydraulic press is preferred, and the pressure is to be exerted in the usual manner. By this improvement, it is stated that the seed will part with the oil more thoroughly, and a larger quantity of it will be obtained from a given quantity of seed than heretofore. The Patentee then proceeds, "Having now described the invention, and the manner of performing the same, I would remark, that although I have stated exact quantities of acid and water to be applied to a certain quantity of seed, yet I do not confine myself thereto, as it will be found that the quality of the seed will in some degree vary the quantities of the diluted acid, which will produce the best effect; but this must, in a great measure, depend on the judgment of the workman, which can only be obtained by practice; but the above quantities are given as the average quantities. Nor do I confine myself to the use of the particular acid named, or to the applying the diluted acid precisely at that part of the operation called grinding, as the same may be mixed subsequently, but before the pressure is applied. In conclusion, I would have it understood that what I claim as the invention of an improvement in obtaining certain oils, consists in the application of diluted acid (muriatic acid in preference) to seeds in the process of obtaining oil as above described."—[*Inrolled September,* 1835.]

To SAMUEL FENTON, *of Fishguard, in the county of Pembroke, South Wales, clerk, for his invention of an improvement or improvements in the construction of locks and latches for doors, gates, and other useful purposes.* —[Sealed 10th February, 1836.]

FOR the description of this invention we beg to quote the following specification of the Patentee:—My invention consists, firstly, of such a latch or bolt hereinafter called a compound-lever-gravitating latch bolt, as is not actuated or propelled by the bit of the key, or by a spring or springs, although to such latch or bolt, as aforesaid, a spring or springs may be applied, and is drawn back or into the lock-case not by the ordinary mode of turning a spindle by means of a knob, into which the end of such spindle is inserted and secured, but by a lever attached to and working in a mortice made in the under side of the common knobs or handles, each knob or handle is to be immoveably fixed to the door by means of screws, and is intended to answer the purpose as well of a fulcrum to the lever aforesaid, as of an instrument for drawing back the door when it shall have been unlocked or unbolted; and here I would particularly wish it to be observed, that the form of the above handle is not confined to that of an ordinary knob, but may be accommodated to the suggestions of fancy: and, secondly, of the locking or securing part, comprising two bolts, having no connexion one with the other; one of which is actuated on the outside of the door by the key, and on the inside of the door by a lever working horizontally in a brass plate by which it is attached to the door; which lever, when drawn from that end of the lock through which the latch bolt projects, the key is prevented from acting either way, and when the key has been used to shoot forward its bolt, the said lever is prevented from being drawn to its destination, as above described, so that when the door is on the inside fastened by means of the bolt actuated by the horizontal lever, the power of the key either to lock or unlock is entirely suspended; and when the door is on the outside fastened by means of the bolt actuated by the key, the power of the horizontal lever to propel its bolt is taken away, and no possibility of unlocking from the inside exists, all communication between the key bolt and the lever bolt being cut off by the intervention of an iron plate; and thirdly, that whereas, in other locks having tumblers to secure the bolts thereof from being pushed back, and the said tumblers are each and all of them raised off the bolts immediately; that is to say, by contact of the *bit* or *web* of the key. There is in the said locking part of my invention a tumbler which is not raised by contact of the bit of the key, and is inaccessible to any instrument, minute or powerful, which may be inserted into the lock through the key-hole; all which assertions will be established by the following description of the drawings.

Fig. 6, is a front view of the lock, with so much of the bolt projecting as is seen in the ordinary mortice locks: A, the aperture, into and in which are inserted, and play, levers in the under part of the knobs, to lift up, and thereby to draw back the latch bolt, presently to be more fully denominated and described; B, the key-hole and the pin on which the key is to revolve, together with the four screws (marked by the figures 1, 2, 3, 4,) which attach the front and back plates to the frame of the lock. This (X) mark denotes the heads of four pins, sustaining four friction rollers riveted into the back plate, and coming through the front plate, each pin having a shoulder at each end; the shoulder at the end riveted into the back plate being for the purpose of ensuring its perpendicular position (for the pins and their shoulders are made by a lathe); and the other shoulder, at the end where the pin comes through the front plate, being for the purpose of preventing that plate from oppressing the latch bolt; and be it observed, that the foregoing remark is precisely applicable to the pin, which is the centre on which the latch bolt moves, which pin is designated by the letter C. Fig. 7, is a back view of the lock D, the aperture for the reception and play of the levers already noticed; E, a slot in the back plate, in which slot the neck of the thumb bolt plays. Fig. 8, is a front view of the lock, the front plate being removed, showing it on the half bolt; by which expression of "half bolt" is meant the projection of so much of the bolt as is to be seen in the mortice locks in common use, and exhibits the two principal parts of which the lock consists; viz. number 1, the compound-lever-gravitating latch and bolt, which I call the latch bolt; and number 2, the locking or securing part. The latch bolt consists of three principal parts; namely, F, the bolt; G, the connecting link; H, the gravitating part, which I call the actuator, resembling a latch in its action. The dotted lines on the bolt F, show the extent of the mortice, in which one end of the connecting link G, is inserted and plays. This connecting link, which serves as a lever to draw in the bolt when the actuator is raised by the lever in the handle of the door, and to propel it when the actuator falls, is fastened to the bolt and actuator by two pins, marked K, and L, inserted through a hole in each end of the said link, the size of which is to be no more than just sufficiently capacious to allow a play about the said pins. The pin L, which secures that end of the link inserted into the actuator, is to be riveted; but the other pin K, securing the other end of the link, is not to be riveted, so as to be moveable, in order to admit of the bolt being shifted to suit a right or left hand lock, as occasion may require.

The actuator works on the pin C, and the bolt F, moves into and out of the lock-case between the four friction rollers N, N, N, N. The actuator H, consists of three pieces; namely, two external plates and an intermediate piece, forming the necessary mortices shown by the dotted lines, and which pieces, together, form the thickness of the lock within the front and back plates. The plates of the actuator are fastened to the intermediate piece by the rivets marked thus (X).

The check R, which prevents the actuator from falling down to its full extent, by one end of it resting in a notch G, formed in the top of the partition plate W, thereby causing the lock to be on the half bolt, is secured by and moves on the fixed pin S. The dotted lines on the actuator immediately above the check, show the mortice into which the check retires upon being raised out of the said notch by the action of the inner tumbler (about to be described) when lifted by the bit of the key. The aperture T, in the actuator, is for the reception of the handle levers, as already described. The locking part, number 2, exhibits the front view of the guide plates O, P; the partition plate W, which cuts off all communication between the key bolt and the thumb bolt; the key pin X; the key bolt Y, drawn back with the notch Q, therein for the reception of the bit of the key; the arm of the outer tumbler Z; the concealed or inaccessible tumbler *a*; the inner tumbler *b*; the butterfly wings *c*, *c*; the upper pin *d*, infixed into the outer tumbler, on which pin the said wings are suspended; the lower pin *e*, infixed into the concealed or inaccessible tumbler, which pin the said wings embrace after the manner of a forceps, by reason of their lateral weight, and by which pin so seized, the said wings raise the inaccessible tumbler as occasion requires. The wings expander *f*; the screw *g*, which attaches the said expander to the partition plate; the staunch pin *h*, to keep the said expander immoveable; the pin *i*, by which the outer and inner tumblers are secured on one side of the partition plate; and the upper tumbler belonging to the thumb bolt is secured on the other side of the said partition plate; the pin *k*, by which the inaccessible tumbler is secured on one side of the partition plate, and the under tumbler belonging to the thumb bolt is secured on the other side of the said partition plate. The dotted lines at the foot of the fore-guide plate O, show the screw by which it is fastened to the frame of the lock, and the dotted lines on the lower part of the guide plate P, show the screw attaching the said guide plate to that part of the frame where it is represented as stationed. The dotted lines *l*, *m*, on the guide plates show the mortices through which the key bolt Y, moves, and by which it is restrained and kept in its place. The round hole *n*, in guide plate P, is for the purpose of enabling the workman to see whether the inner extremity of the outer and inner tumblers allow the key bolt, when in being drawn back by the key, to pass them at that point of the said bolt next to the inner extremities or catches of the said tumblers, air-tight, or with the least possible space between the points of contact.

Fig. 9, is a front view of the lock, the front plate being removed, showing it in a *locked* state, with the bolt F, protruded to its full extent. The dotted lines A, A, A, on the beak of the actuator, show the mortice into which the key bolt Y, is propelled; the point B, is a step in the upper part of the key bolt, into which the inaccessible tumbler is shown as having fallen; the point C, is a step in the upper extremity of the said key bolt, on which the outer and inner tumblers are shown as having fallen. Fig. 10, is a front view of the lock, showing the bolt F, drawn entirely into the lock-case by the operation of the handle lever in the aperture T. Fig. 11, is a plan of the lock, including the front and back plates; *p*, shows the bevelled part of the bolt F; *g*, *g*, the handle lever on each side. Fig. 12, is a back view of the lock, the back plate being removed, showing it on the half bolt, and the check R, in the notch already described: A, is the upper tumbler belonging to the thumb bolt, which said tumbler serves to raise the check out of the notch, so as to allow the actuator to fall down, and thereby propel the bolt F, to its full extent; B, is the under tumbler belonging to the thumb bolt, the extremity of which acts as a lever to raise the upper tumbler when the shoulder C, is pressed against the corresponding shoulder D, by the action of the horizontal lever inserted into the slot F, in the thumb bolt E, when drawn from that end of the lock where the bolt F, projects. The dotted lines *l*, *m*, on the guide plates, show the mortice in which the thumb bolt E, moves, and is restrained; the dotted lines *a*, *a*, *a*, on the beak of the actuator, show the chamber for the reception of the thumb bolt when propelled by the horizontal lever: the dotted lines S, T, U, show the gap in the main plate of tumbler A, which gap allows the free play of that end of the horizontal lever inserted into aperture F, in the thumb bolt E. Fig. 13, is a back view of the lock, the back plate being removed, showing it in a bolted state, the thumb bolt E, having been propelled into its chamber *a*, *a*, *a*. Fig. 14, shows the butterfly wings A, B; the pinion of wing A, is halved from *a*, to *b*; the pinion of wing B, is also halved, on the reverse side to the pinion of wing A, from *c*, to *d*. Fig. 15, shows the outer tumbler, *d*, the upper pin on which the butterfly wings are to be suspended; Z, the arm by which the said tumbler is raised by the bit of the key: *c*, the arc in which the bit of the key moves when it raises the said tumbler; *b*, *b*, *b*, are the rivets attaching the said arm to the main part of the said tumbler, which main part extends from D, to D. Fig. 16, shows the inaccessible tumbler; *e*, is the pin by which, being embraced by the forceps in the lower extremity of the butterfly wings, the said tumbler is raised off the step in the key bolt; *f*, is the catch of the said tumbler: the dotted lines show the projecting collar on the reversed side. Fig. 17, is a plan of the inaccessible tumbler; *e*, is the pin which the butterfly wings embrace; *g*, is the collar, the extent of the projection of which is to be regulated by the thickness of the inner tumbler, but yet exceeding that in thickness so much as to admit of the said inaccessible tumblers playing free of the surface of the said inner tumbler. Fig. 18, shows the inner tumbler; D, is the space allowed for the collar of the inaccessible tumbler, the projection of which collar is so far to exceed the thickness of the said inner tumbler, that the said collar moving on or against the partition plate W, the inaccessible tumbler may play quite free of the surface of the inner tumbler; B, the catch, which when the key bolt has been protruded into its chamber in the beak of the actuator, falls on the step in the upper end of the said bolt, and serves to restrain it in that position; and when the said bolt has been drawn back, the part E, as shown by the dotted lines in hole *n*, in guide plate P, in fig. 8, falls down into an aperture or open space (lying between the lintel of the mortice in the said guide plate, and the piece of metal attached to that end of the key bolt lodged in the mortice of the said guide plate, and on that side of the said key bolt next to the partition plate,) and thereby keeps the said key bolt from removing from that position in which after it had been thrown back it was left by the key; *c*, the arc in which the farther apex of the bit of the key moves in order to raise the said tumbler. Fig. 19, shows the key bolt; Q, the notch for the reception of the bit of the key; H, the shoulder, which prevents the said bolt from being thrust too far forward; B, the step to receive the catch of the inaccessible tumbler; C, the step for the reception of the catches of the outer and inner tumblers. Fig. 20, shows the plan of the key bolt; L, the piece of metal attached to that end of the said bolt lodged in the guide plate, and on that side of the said bolt which is next to or faces the partition plate, which piece is required to be of the same thickness as the piece fastened to the fore part of the partition plate, and described in fig. 21. Fig. 21, shows the partition plate W, (guide plate O, being taken off and the key bolt removed) remaining infixed in guide plate P: A, the piece attached to the partition plate, the thickness of which piece is to be such as to make sufficient room between the key bolt and the partition plate, for the free play of the inner tumbler shown in fig. 18. A similar piece is attached by the same rivets to the other side of the partition plate, in order to make sufficient room between the thumb bolt and the partition plate for the free play of the lower part of the main plate of the upper thumb bolt tumbler, described in fig. 12. The dotted lines *b*, and *c*, show the depth of the groove in guide plate P, into which the partition plate is inserted. This and the corresponding groove in guide plate O, must be exactly in the centre of each guide plate. The perpendicular dotted line *d*, shows the superficial dimensions of the piece attached to that part of the partition plate, and corresponding in thickness to the piece A, described already in this figure.

The horizontal lines *e*, *e*, show the thickness of the lintel of the mortice in the guide plate P. The space between the perpendicular lines *f*, *f*, show the width of the said lintel: G, the notch in the top of the partition plate, into which the check falls; H, the check of guide plate P, which serves to keep the outer and inner tumblers in their place, consisting of the space between the check aforesaid and the partition plate, and to ensure their motion to be equable. Fig. 22, is a plan view of fig. 21: A, A, and B, B, are the pieces attached to the partition plate, of such thickness as to make sufficient space for the inner tumbler on the one side, and for the lower part of the main plate of the upper thumb bolt tumbler on the other side of the partition plate, to play freely between their respective bolts; and the partition plate X, is the key pin. Fig. 23, shows that part of the beak of the actuator which fronts those ends of the key and thumb bolts that are protruded into the chambers seen in the said beak for their reception: A, and B, the two outer plates of the actuator; C, the chamber for the reception of the key bolt; and D, the chamber for the reception of the thumb bolt; E, a swing plate or drop suspended on the pin F, which, whenever it be touched by either the key or thumb bolt in the act of entering, it swings to the opposite side of the room it occupies; and the said swing plate or drop is for the purpose of preventing the room door having this lock in it, from being fastened on both sides at the same time; for whenever the key bolt is propelled into its chamber C, the drop being thrown in consequence against the inside of that plate of the actuator marked B, obstructs the entrance of the thumb bolt; and whenever the thumb bolt is propelled into its chamber D, the drop being in consequence thrown against the inside of that plate of the actuator marked A, obstructs the entrance of the key-bolt; G, G, that part of the chamber intended for the retirement and repose of the check R, where the said check is secured by the fixed pin S, which pierces it. Fig. 24, shows the thumb bolt E, seen in fig. 12. The oblong square aperture F, is to admit the end of the horizontal lever, and has a piece of metal projecting from each end, and to be clearly seen in the plan view of this bolt. Fig. 27, which pieces form a kind of neck which traverses in the slot E, in the back plate of the lock seen in fig. 7: C, the shoulder which prevents this bolt from being thrust too far into the beak of the actuator, and from C, to D, it is to be made about one-third shorter than is the key bolt from H, to O, in fig. 19: and be it observed, that both these bolts are to have those ends which are propelled into the beak of the actuator bevelled on each side, so as to represent an obtuse wedge, as appears from the respective drawings in figs. 19, and 24, of those parts of these bolts now in being described. Fig. 25, shows the under thumb bolt tumbler, the upper extremity of which at X, acts as a lever to the upper tumbler by the operation of the shoulders against one another, as set forth in fig. 12. Fig. 26, shows the upper thumb bolt tumbler; *p*, *p*, is the piece attached to the main plate of this tumbler marked *t*, *t*, and is to be of the same thickness as the under tumbler B, as shown in fig. 12. Fig. 27, is a plan of the thumb bolt. Fig. 28, shows the guide plate O. The horizontal dotted lines *a*, *a*, *b, b,* show the extent of the mortice through which the key and thumb bolts traverse; *c, c,* show the extent of the central groove, into which the partition plate is inserted. The space between the dotted lines *d, d,* is the thickness of the lintel of the above mortice: *e,* is the hole for the pin which supports the outer and inner tumblers on one side of the partition plate, and the upper tumbler of the thumb bolt on the other side of the said plate; *f,* the hole for the pin which supports the inaccessible tumbler on one side of the partition plate, and the under tumbler of the thumb bolt on the other side thereof.

Fig. 29, shows the key: A, is the bit or web; *b,* is the point or apex which raises the inner tumbler; *c,* the point or apex which raises the outer tumbler; and *e,* is the cleft which admits the bolt. The part immediately above *e,* is bevelled, which being brought in contact in the operation of unlocking with that side of the top of the notch Q, in the bolt (seen in fig. 19,) towards the right hand, extracts the said bolt out of the beak of the actuator, the tumblers having all been raised sufficiently high, so as to allow the bolt barely to pass the extreme angles of their catches by the two points or apices *b,* and *c,* both which are rounded off in the form of a semicircle.

Fig. 30, is an end view of the key, showing the tube, and the thickness of the bit. Fig. 31, is a plan view of that part of fig. 28, which faces fig. 23; the dotted lines at the lower extremity represent the receptacle for the screw, which attaches guide plate o, to the frame of the lock; *b, b,* are the ends of the key and thumb bolts, drawn into the said guide plate; *a, a,* are the ends of the two pieces, attached to each side of the partition plate, described in fig. 21; *w, w,* is the end of the partition plate, which is to be (as represented) flush with this face of the said guide plate. Fig. 32, is a plan of fig. 28; the aperture *c, c,* shows the groove into which the partition plate is inserted, as already noticed in fig. 28; *d*, the depth of the groove in the lintel at *b*, in fig. 28, for the reception of the partition plate at o, in fig. 21; *g*, the groove above the lintel, for the reception of the partition plate at *p*, in fig. 21, and shown between x, x, in fig. 31. Fig. 33, is a plan view of that part of the guide plate P, which rests against the inside of the end of the lock frame, where it is exhibited as stationed in fig. 8. Fig. 34, is the partition plate, guide plate P, being taken off; *p*, is the notch or slot which receives the lintel of the mortice in the said guide plate, already described in fig. 21. Fig. 35, is a side view of the knob handle, showing the latch bolt lever in it; *a*, is the plan view of the plate, by which, through means of screws, the said knob handle is fixed to the door; *b*, is the latch bolt lever, fastened into the knob handle by the fixed pin *c*; *d*, is the shoulder, where the end of the said lever is halved, and is formed by halving the end of this lever. I would here observe, that the above shoulder must be made to work quite free of the plates of the lock, that the above description of the said lever be as shown in fig. 35, is equally applicable to the way in which the corresponding lever, the knob handle into which it is fastened, &c. on the other side of the door, is to be formed and fastened; and that the method by which the said lever is made to raise and draw in or back the latch bolt, is by placing the thumb on the circumference of the knob at T, and the forefinger to the under part of the lever at F, and pressing the said finger in the direction of T. Fig. 36, is a horizontal view of the horizontal lever, which lever propels and draws back the thumb bolt; *f*, *f*, is the plate (of the superfices of which fig. 37, affords a view) whereby the said lever is fastened in the door; *e*, *e*, show the little plates let into and brazed in the plate (seen in fig. 37,) on each side of the slot *h, h,* so as to form a guide mortice for the said lever, in which mortice the said lever is secured by the fixed pin *m.* Fig. 37, is a superficial view of the plate noticed by anticipation in fig. 36 : *n, n,* are the holes which are to attach it to the door; *h, h,* the slot in which the lever is moved horizontally, in order to propel or draw back the thumb bolt; *m, m, m,* show the fixed pin, already noticed, which supports the said lever.

Fig. 1*, shows another kind of compound-lever-gravitating latch and bolt in a front view of the lock, the front plate being removed, with the bolt part full out: A, is the bolt part; B, the gravitating part or actuator, and formed after the same manner as is described in fig. 8, and is raised by the handle levers as has been already noticed; *c,* is the screw or centre on which the bolt A, is suspended; *d,* is a similar centre, on which the actuator B, is suspended, and both these screws are inserted into the back plate of the lock. The space or plane included in *e, f, g,* is the blade of the bolt, and plays up to the shoulder, demarked by the line *e, f,* in the mortice in the actuator, the extent of which is shown by the dotted curved line *h, i, k.* From *l,* to *m,* is the slot in the blade of the bolt; the circular dotted line shows the roller upon or about which the bolt traverses by means of the slot in the blade as above noticed, for the roller is kept revolving in the same place by the screw *n,* which pierces the said roller, having first passed through one of the plates of the actuator, and is fastened in the other plate thereof.

Fig. 2*, is a front view of the lock, the front plate being removed, showing the bolt drawn completely into the lock case, and the blade of the bolt entirely encased up to the shoulder, noticed above in fig. 1*, in the mortice of the actuator. It may here be observed, that the height of this shoulder (which is to be made on each side the bolt so as to render the blade exactly in the centre of the bolt) is to be regulated by the thickness of the plates of the actuator, so as to be flush with their outer surfaces. The locking part, which is a blank in both figures, being similar to that seen in fig. 8, need not here be spoken of, as it has already received a detailed description. It should, however, be observed, that the same key acts on both sides of the above locking part, but produces no difference of result from what is produced by the locking part number 2, above so minutely noticed.

Now whereas, having described the said improvement or improvements in the construction of locks and latches applicable to doors, gates, and other useful purposes, I hereby declare that I claim as constituting the said improvement or improvements and invention, first, the arrangements hereinbefore described of the parts forming together the compound-lever-gravitating latch bolt, together with the check R, and swing plate or drop which prevents the door from being fastened on both sides at the same time, to be applied independently of, as well as in combination with, the locking or securing part. I claim, secondly, the concealed or inaccessible tumbler, with the mode of raising it by means of one or both of the butterfly wings, which render the immediate contact of the said tumbler by the bit of the key, or by any instrument inserted into the lock by the key hole, unnecessary and impossible; and in the event of the said locking part either with or without the said compound-lever-gravitating latch bolt being applied to a safe, writing desk, drawer, government box, &c. I claim, thirdly, the multiplication of the bolt therein, which is actuated by the key, and the enlargement of the bit and the multiplication of the cleft in the bit of the key according to the number of bolts to be actuated, and a separate set of tumblers, including the concealed or inaccessible tumbler, and the butterfly wings to raise it, to each bolt; the several sets of tumblers being all similar or varied, according to the discretion of the manufacturer. I claim, fourthly, that the method of drawing back or into the lock-case, the latch bolt be not confined to that mode which has been noticed in a preceding part of this specification, and in the remarks under fig. 35, but by any other contrivance, such as of an additional lever, which may answer the same purpose of drawing back or into the lock-case the said latch-bolt, as is effected by the contrivance shown and described in fig. 35, according to the fancy or discretion of the manufacturer. And, lastly, I claim the downward action, or action towards the bolt of the said tumblers, to be insured by the application of a spring or springs, if considered necessary, or if occasion should require a spring or springs. And the said improvement or improvements and invention being, to the best of my knowledge and belief, entirely new as to arrangement, and never before used within that part of his Majesty's United Kingdom of Great Britain called England, I do hereby declare this to be my specification of the same, and that I do verily believe that this my specification doth comply in all respects fully and without reserve or disguise with the proviso in the hereinbefore in part recited letters patent contained, wherefore I do hereby claim to maintain exclusive right and privilege to the said invention.—[*Inrolled in the Rolls Chapel Office, July,* 1836.]

To James Aldous, *of Clapton, in the county of Middlesex, smith, for certain improvements in steam-engines.*— [Sealed 25th February, 1834.]

These improvements in the construction of steam-engines consist in removing the working cylinder from immediate connexion with the ordinary cross-head or beam, and employing a combination of levers familiarly called "lazy tongs," as an intermediate means for communicating the power to the crank. Plate III., fig. 38, represents a side elevation of this arrangement: *a*, is the working cylinder mounted on the frame *b*, *b*, which is provided with a parallel slot or guide, in which the cross-head *c*, reciprocates, for the purpose of giving motion to the connecting rod *d*, which actuates the beam *e*, one of these frames being mounted on each side of the engine in the frame *f*, *f*, at *g*; the further end of the beam *e*, is connected to a sliding frame, which moves in the parallel guide *h*; to this sliding frame the combination of levers or "lazy tongs" *i*, *i*, are connected, the levers *i*, *i*, at their upper ends being jointed to the cross-head *k*, to which is also coupled the connecting rod *r*, which communicates motion through a crank to the shaft *m*. Steam having been admitted into the working cylinder *a*, the beam *e*, by means of the cross-head *c*, and connecting rod *d*, is elevated or depressed, when its further end acting upon the combined levers *i*, causes them, by expanding or contracting, to give motion to the connecting rod *l*, and main shaft *m*. Connected to the other end of the cross-head *k*, there is a similar combination of levers and connecting rod, which actuate another crank on the lower shaft *n*, which is connected to the upper one by means of pinions; and the Patentee observes that both may be used for the purpose of driving machinery; and as they revolve in contrary directions, the centres of the engine will be more easily overcome.

In conclusion, he remarks, I lay no claim to any of the parts separately nor combined, other than is here particularly stated, nor do I confine myself to the precise arrangement here shown, nor the relative proportions, but claim the application of the combined series of levers with the cross-head *k*, the cranks and main shafts, as above described.—[*Inrolled in the Inrolment Office, August,* 1834.]

To JOHN SYLVESTER, *of Bloomsbury, in the county of Middlesex, engineer, for certain improvements in apparatus used in the communication or transmission of heat to aeriform, liquid, and solid bodies.*—[Sealed 11th March, 1835.]

THIS improvement in conveying heat consists, in the first place, in the forming of bottoms of boilers or evaporating vessels with short projections, termed by the Patentee canoidal protuberances, the projections either in transverse ribs or detached cones extending upwards and downwards, for the purpose of receiving and conveying heat to the water, or other liquid to be evaporated. Fig. 15, Plate II., exhibits a section of the first form for the bottom of a boiler, described by the Patentee. Fig. 16, shows another form intended to be manufactured of inch plates. Fig. 17, represents the section proposed for an evaporating pan for saccharine, saline, or other solutions; in this instance, the bottom is composed of ribs or corrugated plates, furnished with small passages *a, a,* in order to prevent a too perfect communication of heat, where the deposit would be hurt by an excess of temperature. The Patentee here states, that solid deposits may, by means of a rake or scraper fitting the grooves, be conveyed into cross channels, and from thence cleared away through an aperture in the end or side of the vessel. Figs. 18, and 19, represent an elevation and section of an apparatus to be used for the purpose of forming a hot-air stove: *a*, is a solid block of burnt earth or other convenient material, being furnished with a " canoidal protuberance:" *b*, *b*, is a cap resting upon the block *a*, having apertures *c*, *c*, for the purpose of admitting the cold air, which, having abstracted heat from the protuberance *d*, rises up the cap *b*, and is conveyed to any desired situation. The Patentee, in conclusion, observes, I claim as my invention of improvements in apparatus used in the communication or transmission of heat to aeriform, liquid, and solid bodies, the elongated heat conducting canoidal protuberances, and also the same united into ribs, both kinds ascending into and among the masses of aeriform, liquid, or solid bodies to be heated, and also in the projections downwards towards the fire of continuations from the same protuberances, when it shall be desirable to increase the effect by receiving the heat from a more intense fire, and I disclaim the mere extension of surface by corrugation, or waving of plates of metal or other material, because that mode does not afford a sufficient body of heat-conducting material to allow the lower part to receive an intense degree of heat, and conduct it rapidly into the mass to be heated, and thus prevent the destructive accumulations of heat in the parts next the fire.—[*Inrolled September*, 1835.]

NOVEL INVENTION.

THE PLANING MACHINE.

Feeling the importance of publicly noticing the daily progress making towards perfection in every thing relative to the mechanical arts, and looking upon our national eminence in machinery as the prime cause of the extensive commerce we enjoy, we at all times feel pleasure in communicating to the public any information relative to mechanics or manufactures likely to be conducive thereto. It is with this feeling we call the attention of our readers to the planing machine of Messrs. Whitworth and Co., engineers, of Manchester, which has been lately patented by that house, the working of which, we understand, exceeds the most sanguine expectations of the inventors.

Among the various causes which, during the last twenty years, have conduced to the progress of the mechanical arts in this country, one of the most important has been the introduction of the planing machine.

To the cheapness, and consequent extension of machinery, as well as to its mathematical perfection and excellence of work, this machine has contributed more than any other.

We understand the machine of Messrs. Whitworth and Co. not only produces a better surface than others, but effects a saving of one-half the power, labour, and time hitherto consumed, which is the gist of all economy. One of the principal novel features in this machine is the reversing tool, by which it is enabled to plane in both directions, thus doing double work with the same wear and tear. This part of the invention possesses the additional advantage of being easily applicable to the old machines.

The fact that this part of the invention has been successfully applied to a large machine in the manufactory of Messrs. Sharp and Roberts, the eminent engineers, of Manchester, speaks volumes in favour of its merits. We shall, as early as possible, report the specification of this patent, together with some account of its working.

New Patents
SEALED IN ENGLAND,
September, 1836.

To Robert Griffiths, of Birmingham, in the county of Warwick, machine-maker, and John Gold, of the same place, glass-cutter, for their invention of certain improvements in machinery for grinding, smoothing, and polishing plate glass, window glass, marble, slate, and stone, and also glass vessels, and glass spangles and drops.—Sealed 1st September—6 months for inrolment.

To John Pickersgill, of Coleman-street, in the city of London, merchant, for improvements in preparing and in applying India rubber caoutchouc to fabrics, being a communication from a foreigner residing abroad.—Sealed 1st September—6 months for inrolment.

To James Surrey, of York House, in the parish of Battersea, in the county of Surrey, miller, for his invention of a new application of a principle by which mechanical power may be obtained or applied.—Sealed 1st September—4 months for inrolment.

To William Bush, of Wormwood-street, Bishopsgate Within, in the city of London, surveyor and engineer, for his invention of improvements in the means of, and in the apparatus for building and working under water, part of which improvements are applicable for other purposes.—Sealed 3rd September—6 months for inrolment.

To Charles Farina, of No. 7, Clarendon-place, Maida Vale, in the county of Middlesex, gentleman, for his invention of an improved mashing apparatus.—Sealed 15th September—6 months for inrolment.

To William Hinckes Cox, of Bidminster, near Bristol, tanner, for his invention of an improvement or improvements in tanning hides and skins.—Sealed 15th September—6 months for inrolment.

To John Frederick William Hempel, of Oranienburg, in the kingdom of Prussia, but now of Clapham, in the county of Surrey, officer of Engineers, and Henry Blundell, of Hull, in the county of York, paint and colour

CELESTIAL PHENOMENA, for October, 1836.

D.	H.	M.	
1			☽ rises 8h. 33m. A.
	—		☽ passes mer. 4h. 39m. M.
	—		☽ sets 1h. 32m. A.
	—		Clock after the ⊙ 10m. 25s.
2	6	42	☽ in □ or last quarter.
	9		☽ in Apogee.
3	16	46	♂ in conj. with the ☽ diff. of dec. 4. 8. S.
4	22	45	♀ in conj. with the ☽ diff. of dec. 4. 55. S.
	23	5	♀ greatest elong. 46. 15. W.
5			Clock after the ⊙ 11m. 38s.
	—		☽ rises morn.
	—		☽ passes mer. 8h. 0m. M.
	—		☽ sets 4h. 12m. A.
	11	54	☿ greatest Hel. Lat. S.
6	0	47	♀ in conj. with the ☽ diff. of dec. 6. 28. S.
7	13	48	♃'s first sat. will im.
	21	36	☿ in conj. with ♄ diff. of dec. 5. 27. S.
9	13	53	☿ in conj. with ♄ diff. of dec. 5. 54. S.
	18	57	☿ stationary.
10			Clock after the ⊙ 13m. 1s:
	—		☽ rises 5h. 53m. M.
	—		☽ passes mer. 11h. 47m. M.
	—		☽ sets 5h. 25m. A.
	1	29	Ecliptic conj. or ● new moon.
11	10	4	☿ in conj. with the ☽ diff. of dec. 3. 57. S.
	10	42	♄ in conj. with the ☽ diff. of dec. 1. 52. N.
14	15	41	♃'s first sat. will im.
	16		☽ in Perigee.
15			Clock after the ⊙ 14m. 11s.
	—		☽ rises 0h. 56m. A.
	—		☽ passes mer. 4h. 19m. A.
	—		☽ sets 7h. 40m. A.
16	11	11	♀ in the ascending node.
17	10	25	☽ in □ or first quarter.
19			Mercury R. A. 13h. 55m. dec. 13. 45. S.
	—		Venus R. A. 10h. 48m. dec. 7. 50. N.
	—		Mars R. A. 8h. 32m. dec. 20. 12. N.
19			Vesta R. A. 15h. 22m. dec. 15. 10. S.
	—		Juno R. A. 12h. 12m. dec. 0. 30. S.
	—		Pallas R. A. 20h. 42m. dec. 0. 35. S.
	—		Ceres R. A. 23h. 3m. dec. 21. 30. S.
	—		Jupiter R. A. 9h. 10m. dec. 16. 53. N.
	—		Saturn R. A. 14h. 20m. dec. 11. 40. S.
	—		Georg. R. A. 22h. 12m. dec. 11. 56. S.
	—		☿ passes mer. 23h. 55m.
	—		♀ passes mer. 20h. 56m.
	—		♂ passes mer. 18h. 39m.
	—		♃ passes mer. 19h. 15m.
	10	20	♅ in conj. with the ☽ diff. of dec. 4h. 31m.
	13	1	♃'s second satt. will im.
20			Clock after the ⊙ 15m. 9s.
	—		☽ rises 4h. 1m. A.
	—		☽ passes mer. 9h. 4m. A.
	—		☽ sets 0h. 57m. M.
	12	48	♃'s first sat. will im.
	16	19	♃'s third sat. will em.
21	10	40	☿ in inf. conj. with the ⊙
	17	53	♃'s first sat. will im.
24			☽ Eclipsed, invisible at London.
	1	4	Ecliptic oppo. or ○ full moon.
24	11	27	☿ in the ascending node.
25			Clock after the ⊙ 15m. 50s.
	—		☽ rises 5h. 9m. A.
	—		☽ passes mer. 0h 6m. M.
	—		☽ sets 7h. 37m. M.
26	15	36	♃'s second sat. will im.
27	16	46	♃'s third sat. will im.
29	0	46	☿ in Perihelion.
	23	36	☿ stationary.
30			Clock after the ⊙ 16m. 13s.
	—		☽ rises 8h. 8m. A.
	—		☽ passes mer. 4h. 12m. M.
	—		☽ sets 1h. 10m M.
	5		☽ in Apogee.
	13	56	♃'s first sat. will em.
	21	44	♄ in conj. with the ⊙

J. LEWTHWAITE, Rotherhithe.

THE

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CONJOINED SERIES.

No. LVI.

Recent Patents.

To James Bullough, *of Blackburn, in the county of Lancaster, mechanic, for his invention of certain improvements in hand looms and power looms.*—[Sealed 1st October, 1835.]

These improvements in hand looms and power looms consist, firstly, in an improved machine, or a new arrangement of mechanism for weaving, in which two pieces of cloth or other fabric can be woven at the same time, either entirely by manual labour or partly by hand, assisted by a rotary shaft driven by steam or other power. In this novel arrangement of machinery, two slays, and also two sets of healds work simultaneously, the warps being given off from two separate rollers or beams, and the work taken up upon two separate rollers or beams, also simultaneously, by a peculiar mechanism which is capable of adjustment for the purpose of enabling the looms to weave cloths of any substance or thickness desired, and with an improved contrivance by means of tension rollers of conducting the warps. With this machinery is also combined a self-acting apparatus for stopping the operations of the looms in the event of one of the weft threads breaking, and also a mechanism for stopping the loom whenever one of the shuttles fails to reach its destined place in the shuttle box.

Secondly, in certain appendages to a loom intended to be worked solely by steam or other rotary power, which appendages nearly resemble in principle the mechanism employed in the former machine for giving out the warp and taking up the work, that is, winding on the cloth; but which power loom is adapted to weave one piece of cloth only at a time: with a mode of varying those operations occasionally as the work goes on, in order to produce a piece of cloth differing in substance in its parts, that is, with thick and thin portions or stripes formed transversely.

In this loom is adapted a modification of the before-mentioned mechanism for stopping the operation of the loom when the weft thread breaks; and also another and different contrivance for effecting the same object under similar circumstances. With these are combined a self-acting apparatus for letting the small portions of cloth run back from the cloth beam which may have been taken up after the weft thread broke; and also a mode of preventing concussion when the machinery stops from the circumstance of the shuttle not having reached its place of destination in the shuttle box.

These improvements are fully set out and exhibited in the accompanying drawings (see Plate IV.), in which, fig. 1, represents the first-mentioned construction of loom in side elevation; fig. 2, is a front view of the same; and fig. 3, a vertical section taken longitudinally through about the middle of the loom: A, *a*, are the two warp beams; B, *b*, the two cloth or work beams; C, *c*, are the two slays connected together by rods D; E, *e*, are the two sets of healds. The front set of healds E, are suspended by cords *f*, *f*, passed over pulleys or rollers *g*, at top, and are connected at bottom to the treadles *h*, *h*. On the axle or shaft of the roller *g*, a toothed wheel is fixed, acting in the teeth of a sliding rack bar *i*; at the reverse end of which bar there is a similar rack, taking into a corresponding wheel fixed on the axle of the back roller *j*, over which the cords of the other or back set of healds *e*, are suspended; these back healds *e*, being kept in tension by their cords passing under the rollers *k*, mounted in the lower part of the framework. In place of the toothed wheels on the axles of the rollers *g*, and *j*, and the sliding rack *i*, rollers and straps might be employed for the same purpose.

A shaft F, is mounted upon the side rails of the frame, and extends transversely through the machine, its ends carrying cranks G, G, which are connected to the lateral rods or links H, H; and the reverse ends of these rods or links H, are attached by joints to the front part of the slay bottom C. On the crank shaft F, a wheel I, is fixed, which takes into a wheel K, upon the tappet shaft L. This shaft L, carries the tappets or excentrics *l*, *l*, which act upon the treadles *h*, *h*, for the purpose of working the front set of healds E, up and down.

It will now be perceived, that on the workman applying his hand to the top rail of the front slay C, and giving to that slay the ordinary vibratory movement, the connecting rods D, will cause the back slay *c*, to perform a similar vibratory movement; at the same time, the crank rods or links H, connected to the front slay C, and to the cranks G, G, swill give to the crank shaft F, a rotary movement; and this shaft, as it revolves, will, through the agency of the toothed wheels I, and K, before described, cause the shaft L, with the tappets *l*, *l*, to revolve, and alternately to depress the treadles *k*, *k*, by which the healds E, are made to open the sheads of the warp for the passage of the shuttle. These movements of the front healds E, will, by means of their cords *f*, *f*, give reciprocating rotary movements to the roller shaft *g*, above; and hence through the intervention of the sliding rack box *i*, and roller *j*, the back healds *e*, will be worked also, and the sheads of the back warp opened simultaneously with that of the front.

In order to relieve the labour of the workman, these parts of the machinery may be driven by steam or other rotary power, by an endless strap *m*, from any first mover, being passed round a rigger *n*, fixed on the end of the crank shaft F, by the rotation of which, the movements above described will be effected, leaving the workman merely to drive the shuttles to and fro at the proper periods; which may be done by the ordinary pecking apparatus, having cords from the peckers of each slay, connected to one pecking stick.

For the purpose of giving off the warps from the beams A, and *a*, and taking up the cloth on the beams B, and *b*, the following mechanism is brought into action:—On the tappet shaft L, there are affixed two small excentrics or cams Q, which, as the shaft L, revolves, act upon the tails of two levers M, *m*, mounted on pivots fixed in the side of the frames at *q*, *q*. At the outer ends of these levers M, *m*, clicks, or catches N, *n*, are attached, which take into the teeth of ratchet wheels O, *o*, fixed at the outer ends of two longitudinal shafts P, *p*, mounted in horizontal positions on the side of the frame, as seen in the side elevation, fig. 1. On these longitudinal shafts P, *p*, there are firmly fixed bosses, formed as worms or endless screws R, *r*, taking into the teeth of wheels S, *s*, fixed on the ends of the axles of the rollers J, J, which conduct the warps from the beams

A, and *a*; these warp beams being held tight by friction cords and weighted levers as in ordinary looms. Upon the same longitudinal shafts P, *p*, there are also other bosses formed as worms or endless screws T, *t*, taking into toothed wheels V, *v*, on the ends of the cloth beams B, and *b*.

It will now be perceived, that by the action of the cams Q, and levers M, *m*, the clicks N, *n*, will be made to drive the ratchet wheels O, *o*, and shafts P, *p*, at intervals, and, consequently, through the worms R, *r*, and T, *t*, and toothed wheels S, *s*, and V, *v*. Such rotary movements will be given to the tension rollers J, J, J, which conduct the warps by friction, as shall cause the required quantities of warp to be given off from the beams A, *a*, and of cloth to be taken up or wound upon the work beams B, *b*; the proportionate velocities of each being dependant upon the gear by which they are driven, and, consequently, by changing the driving wheels, cloths of different substances may be produced.

The diameters and rotary movements of the taking up gear T, *t*, and V, *v*, being arranged for winding the cloth upon naked beams A, *a*, of certain diameters, it is necessary, as the cloths accumulate on the beams enlarging their diameters, that a mode of decreasing their taking up speed should be provided; this is done by the following contrivance:—The bosses of the worms or endless screws T, *t*, are not firmly fixed to the shafts P, *p*, as the bosses of the other worms R, *r*, but are held thereto by the friction of the surface plates U, *u*, against which the plates of the bosses T, *t*, are pressed by strong helical springs. Hence the force arising from any increased tension of the cloth in winding upon the beams will be exerted through the wheels V, *v*, in forcing back the bosses T, *t*, and thereby separating them from the surface plates U, *u*, which will allow the shaft P, *p*, to slip round within the bosses, and only to act in winding up the cloth when its tension upon the beam becomes relaxed, and the springs force the friction plates into close contact.

The contrivances for stopping the loom when the weft thread breaks, consists of the following mechanism:—w, is a light lever standing across the loom in front of the slay; which lever hangs upon a pivot *w*, at the side of one of the standard posts, seen in the front elevation, fig. 2. This lever w, extends about half way across the cloth, having its end bent downward, with a blunt point bearing upon the surface of the cloth within three or four threads of the edge of the work beaten up by the reed: x, is a small finger lever, placed under the former, and at right angles to it, see the section, fig. 3. This finger lever is mounted upon a double-armed lever *x*, *x*, acting upon a fulcrum pin or axle passed through its centre. When the point of the lever w, bears upon the cloth, the lever is kept up in the situation shown in fig. 2, and the weight at the back of the finger lever x, keeps that lever up also with the double-armed lever *x*, *x*, in the position represented in fig. 2; but in the event of the weft thread breaking, the reed will beat up the work three or four times without any filling weft; and the taking up of the cloth upon the work beam proceeding at the same time, the then imperfect portion of the work produced by the deficiency of filling weft threads, will be brought under the point of the lever w, which point being then without support, will necessarily fall through between the warp threads, and cause the lever w, to descend into the situation shown by dots. This descent of the lever w, will depress the finger lever x; and then the slay c, in advancing, will, by striking against the end of the finger x, throw it and its double-armed lever *x*, *x*, into the position shown by dots in the section, fig. 3, when the lower end of the double-armed lever *x*, rising, and coming into contact with a projection or stop fixed to the under part of the slay bottom, will prevent the slay from being brought forward. It is to be observed, that the same construction of mechanism must be applied in a similar manner to the back slay as well as to the front; and, consequently, in the event of the weft thread breaking in either, the further beating up of the work will be prevented in both.

In order to cause the operations of the loom to be instantly suspended when the shuttle has not reached its place of destination in the shuttle box, the following mechanism is employed :—A finger lever Y, seen in the side elevation, fig. 1, is mounted upon a double-armed lever *y*, *y*, which acts upon a fulcrum pin or axle near its centre, and the tail or lower end of this lever *y*, bears against a weighted lever z, hanging upon a stud fixed in the side frame at *z*. The shuttle having reached its proper place in the shuttle box, on the slay advancing, the side of the shuttle will come in contact with the end of the finger Y, and push it and the double-armed lever *y*, *y*, back, and cause the lever z, to be depressed into the position shown by dots; but whenever the shuttle fails to reach its place of destination, the end of the finger Y, is not acted upon by the advance of the stay; the levers *y*, *y*, and z, therefore remain quiescent, and the slay is arrested in its progress by a stop or projection under the slay bottom coming in contact with a catch or notch in the edge of the lever z. This piece of mechanism is to be adopted in the same way to the slay on both sides of the loom; and in a loom with double slays, as described, it may be applied in a similar manner to the front as well as the back slay.

It sometimes happens that the shuttle stops in a situation partly in its box and partly in the sheads of the warp; in this case, when the slay advances, the side of the shuttle would strike against the end of the finger lever x, above described, and cause the lower end of its double-armed lever *x*, *x*, to rise and come in contact with the stop at the underside of the slay bottom, and so arrest the progress of the slay; for this purpose I should adapt a similar finger lever to the slay on both sides ote loom.

Fig. 4, represents an end elevation of my improved loom, to be driven by steam or other rotary power; fig. 5, is a plan or horizontal view of the same; and fig. 6, is an elevation of the loom taken at the back part: A, is the warp beam; B, the cloth beam; C, the slay, carrying the reed and shuttle, which slay is connected by rods *d*, *d*, to the main driving or crank shaft D. The pecker sticks *e*, *e*, are mounted upon perpendicular shafts E, E. The healds F, are suspended by cords and straps from the rollers *f*, *f*, above, and are attached to treadle levers G, G, below. The main driving crank shaft D, carries a toothed wheel *g*, which takes into another wheel *h*, fixed on the lower or tappet shaft H. On this shaft H, are also the tappets *i*, *i*, that alternately depress the treadles G, and thereby work the healds F. Upon the same shaft are also other tappets *k*, *k*, affixed to crank arms at the ends of the shaft H, which are intended to work the pecker levers K, K. These pecker levers are suspended from studs *l*, *l*, fixed on the side frames above, and are connected near their lower ends by straps *m*, *m*, to segment levers *n*, *n*, on the perpendicular shafts E, E. Hence it will be perceived, that as the shaft H, revolves, the levers K, K, will be acted upon by the force of the rotary tappets *k*; and through the agency of the straps *m*, and shafts E, the pecking sticks *e*, *e*, will be made alternately to give smart strokes to the peckers for the purpose of driving the shuttle to and fro.

Thus far I have only described the operating parts and movements for a power loom of the ordinary construction.

The mode of giving off the warp from the beam A, and of taking up the cloth on the beam B, is the first peculiar feature of improvement which I have adopted to a loom of this description.

A longitudinal shaft P, is mounted on brackets *p*, *p*, at the side of the frame, as seen in figs. 4, and 5. On this shaft is fixed a ratchet wheel O, which wheel, with the shaft P, are driven round by the action of a click connected to the compound lever M, M, shown by dots in fig. 4, but more clearly in the transverse section, fig. 7; and the representation of the mechanism as it would appear on the reverse or inner side of the frame at fig. 8. This compound lever M, M, hangs on studs *n*, *n*, fixed on the framework, and is acted upon by the rotary cams Q, on the tappet shaft L, which causes them to rise and fall into the position shown by dots in fig. 8. The click N, hangs by a stud in a lever *q*, which turns loosely upon the shaft P; and this lever is supported by a forked arm *r*, attached by a joint to the compound lever M. It will now be perceived, that as the tappet shaft L, revolves, such vibratory movements will be given to the compound lever M, as will cause the click N, to drive round the ratchet wheel O, and with it the longitudinal shaft P, which, through the agency of the worms R, and T, and the wheels S, and V, in a similar way to that described in reference to the hand loom, communicates rotary movements to the rollers J, J, for conducting the warp, and to the work beam B, for taking up the cloth.

In order to relieve the tension of the cloth as it winds upon the beam B, the worm T, is attached to the shaft P, by the friction plates T, and U, as before described.

For the purpose of varying the substance of the cloth in parts as it is produced in the loom, that is, weaving it in transverse stripes, having a greater number of shorts or weft threads in a given space in one part, and a lesser number in a given space in another part, technically called "*gauze cross-over,*" I change the giving out and taking up speed of the warp at intervals, by varying the extent of action of the driving click N. This is effected in the following manner:—The click N, and its lever *q*, are worked, as above described, by the rising and falling of the compound lever M, and forked arm *r*; the circular movement of the ratchet wheel O, and its shaft P, must, therefore, depend upon the extent of the stroke given to the click by the rising and falling of the lever M: and this is made, in the first instance, to drive the warp at the greatest giving out and taking up speed, that is, to operate with a speed suited to the production of the thinnest cloth or gauze portions of the fabric; but, in order to diminish this speed of the warp, I shorten the stroke of the driving click N, by bringing a stop lever *t*, into operation immediately under the click lever *q*; the upper end of which stop lever then arrests the descent of the lever *q*, when it has fallen through only a part of its arc; consequently, on the rising of the forked lever *r*, at the next upward stroke of the compound lever M, the lever *q*, and click N, will be raised but a trifling distance, and therefore the ratchet wheel will be driven through a smaller portion of a rotation than when the lever *q*, and click N, passed through a larger arc; hence, by the diminished speed of the warp, a greater number of weft threads will be introduced into the work in a given length of warp, and the cloth in those parts will necessarily be made thicker. The stop lever *t*, is mounted nearly in a perpendicular position upon a stud, set in the inner side of the framework, as shown in figs. 7, and 8, having a tendency to hang a little on one side, but is brought into a perpendicular position by a segment cam *v*, on the rim of the wheel *u*. This cam *v*, as the wheel *u*, revolves, acts against the tail of the lever *t*, and forces it into such a position as will cause its upper end to stand immediately in the way of the click lever *q*, and prevent its descent, as above said. The extent of the segmental arc of the cam *v*, will determine the width of the stripe of thick cloth; and it is obvious that several cams of small segmental extent may be so applied on one wheel for the purpose of producing repetitions of thick and thin stripes in the fabric, and which, indeed, will provide the means of working varieties of patterns in such goods. It is necessary to observe, that a drawing catch *w*, should be attached to the lower arm of the compound lever M, for the purpose of giving rotary motion to the wheel *u*, by the rising and falling of the compound lever.

The mechanism for stopping the loom in the event of the weft thread breaking, will be seen by reference to fig. 9, which is a partial view of the front of the loom; and fig. 10, a partial section taken longitudinally within the framework, looking toward the right hand of fig. 9.

A light lever w, having a blunt point, is mounted upon a fulcrum pin *w*, fixed in the back of the breast beam, the point of the lever in this case standing upwards against the under surface of the cloth, within a few threads of the edge of the work, or the weft last beaten up by the reed. From this lever w, a plummet rod a, is pendent by a loose joint. At the side of the loom is fixed a spring lever b, which is called the knocking-off lever, and this is connected by a rod which protrudes through it to the guider c, of the strap which communicates the rotary power to the driving pulley. A horizontal catch lever d, mounted on a bracket at the side of the frame, and held by a spring e, confines the knocking-off by a notch in its side, in the situation represented at fig. 9. A sliding bar f, f, of a bent form (see fig. 10) is supported upon guide pins passed through slots in the bar. These guide pins are set in the sides of the frame, and the bar f, f, is enabled to slide to and fro upon them. Two studs g, g, are fixed in the side of this sliding bar, for the purpose of being acted upon by the leg of the slay as it vibrates, in order to move the bar to and fro. Another stud h, is also fixed in the sliding bar, which is intended to act (when required) against the catch bar.

In this position of these parts the evolutions of the loom may go on the bar f, f, being slidden to and fro by the leg of the slay without acting upon the catch lever; but in the event of the weft thread breaking, the progressive winding of the cloth into the beam, will cause the thin part of the work wanting filling to be brought over the point of the lever w, which will allow the point to rise through the thin part of the work; and the other end or longer arm of the lever w, falling into the position shown by dots in fig. 9, will bring down the plummet a, into the socket i, fixed to the back of the catch lever d. The plummet now resting in the socket i, on the slay receding, its leg will strike against the back stud g, and slide the bar backward, which will cause the stud i, to come in contact with the plummet a, in the socket i, and to force it and the catch lever d, back sufficiently to release the spring lever b, from the notch in the edge of the catch lever d; and the spring lever b, which is now passing to the position shown by dots in fig. 9, will cause the driving strap to be conducted from the fast to the loose pulley, and hence the loom to stop its operations.

The other method of stopping the loom when the weft thread breaks, will be understood by reference to fig. 11, which is a partial section taken longitudinally through the loom, showing the breast beam k, and the slay c. In the front of the slay, a socket plate l, is fixed, in which a sliding plate m, is enabled to move up and down freely. The top of this sliding plate carries a light lever or fork n, hanging over a recess in the slay at o, near one of the shuttle boxes, as seen also in the horizontal view of the loom, fig. 5. At the back of this recess o, a right-angled piece p, is affixed, having horizontal grooves or flutes in its upright part next the recess; and over the top of the recess, a grating q, is placed, for the shuttle to slide over without impediment, as it passes to and fro along the slay. To the breast beam k, a bent arm r, r, r, is affixed, by the surfaces of which the lower end of the sliding plate m, is guided; as it moves along by the advance of the slay, the plate and its lever m, and n, being held up, as shown by dots, while sliding over the horizontal part of the arm, r 1, in order that the shuttle may pass under it. As the slay advances, the end of the plate m, descends upon the inclined plane r 2, and in so doing causes the forked lever n, to come down upon the grating q. If the weft thread continued entire, it would be carried along the slay by the shuttle, and lie with a slight degree of tension over the grating q, at or near (*); and the fork or light lever n, in descending, would be supported near its end by the thread, until by the further descent of the sliding plate m, the lever n, would be brought nearly into a horizontal position, as shown in fig. 11, and its end lodged in one of the grooves of the piece p: under these circumstances the plate m, and lever n, will not be allowed to descend any further though the slay advances. But in the event of the weft thread having broken from the shuttle, the end of the lever n, in descending, would meet with nothing to support it, and would then pass through the grating in the inclined position shown by dots to the bottom of the recess o; and as the slay advances, the lower end of the sliding plate m, would, at the same time, descend, until it had passed over a notch s, in a sliding catch plate t, t, attached to the side of the bent arm r. Now, on the return or receding of the slay, the lower end of the plate m, will take hold of the notch s, and draw the catch plate t, t, into the situation shown by dots, when a tail v, projecting from this plate, will press against the edge of the catch bar d, described above in reference to fig. 9, and by releasing the spring lever b, will cause the guider c, to throw the driving strap from the fast to the loose pulley, thereby stopping the evolutions of the loom, as before explained. In order to hold up the lever or fork n, in the absence of the weft thread, when the shuttle is in the box at the reverse end of the slay, a stop u, is affixed to a swinging lever mounted in the socket plate l, in front of the slay, which lever and stop is brought up under the catch j, fixed in front of the sliding plate m, by the action of a strap w, w, extending from the back of the breast beam, as shown by dots in fig. 5, and attached at the reverse end behind the pecker to the rod on which the pecker slides. On the return of the shuttle into its box at this end of the slay, the shuttle causes the pecker to strike against the end of the strap w, by means of which the lever and stop u, are withdrawn from under the catch j, and the sliding plate m, with its lever n, fall into action, as described above. In order to bring back, let off, or unwind that small portion of the cloth which has been taken up on the work beam after a weft thread broke, so that the cloth when the weaving is resumed may be perfect, I adopt the following contrivance:—A horizontal rod x, x, see fig. 9, is placed behind the work roller, one end of which has a notch that the spring lever b, falls into; the other end of this lever is attached by a joint to an upright rod, which carries a rack catch y, taking into a ratchet wheel z. When the spring lever b, stands in the position shown in fig. 9, the rack catch y, will be drawn by the rod x, out of action; but when the spring lever has been let off by the receding of the catch lever d, the spring lever b, will cause the horizontal rod x, x, to be slidden to the left, and to put the rack catch into the teeth of the wheel z.

This wheel z, is fixed upon the end of the lateral shaft P, carrying the worms T, and R, as seen in fig. 4, consequently turns with that shaft; the workman, therefore, in moving the spring lever d, into the situation shown at fig. 9, naturally draws the rod x, and rack catch y, to the right, and thereby produces such a retrograde rotary movement of the ratchet wheel z, and shaft P, as will cause the required quantity of cloth to be unwound from the work beam.

In order to prevent a violent concussion from the sudden stopping of the loom when the shuttle has not reached its place of destination, I have varied the position of the ordinary stop applied to power looms, so as to allow the stop to come into operation when the driving crank has nearly reached the end of its throw, that is, when the slay in beating up the weft has reached within about an inch of the work, then the stop, which is the lower end of a double-armed lever pendant from the back part of the slay, hangs down in such a position as to strike with very little impetus against the knocking-off slider, and by thus gently pushing the end of that slider against the back of the spring lever b, forces it forward away from the notch of the catch lever d, and thereby throws off the driving strap, and suspends the evolutions of the loom, as before described.

Having now set out my several improvements in hand and power looms in connexion with the mechanism of hand and power looms, as commonly constructed, I have, lastly, to state in what the several features of my improvements particularly consist, and which I claim under the said above-recited Letters Patent:—That is to say, first, the novel arrangement of the parts of a loom in which two pieces of cloth are produced at one operation, as described. Secondly, the mechanism for giving off the warps from their beams, and taking up the cloths upon their beams by simultaneous operations, with the mode of relieving the tension. Thirdly, the apparatus for stopping the loom when the weft thread breaks, or the shuttle does not reach its place in the shuttle box. Fourthly, the contrivance for varying the substance of the cloth in certain parts. Fifthly, the means by which a portion of the cloth is unwound from the work beam, in order to make the weaving perfect; and, sixthly, the manner of relieving concussion, when the evolutions of the loom are suddenly stopped.—[*Inrolled in the Rolls Chapel Office, April,* 1836.]

Specification drawn by Messrs. Newton and Berry.

To JOHN JEREMIAH RUDBERY, *of Birmingham, in the county of Warwick, umbrella and parasol furniture manufacturer, for his invention of certain improvements in the making or manufacturing of umbrella and parasol stretchers.*—[Sealed 7th April, 1836.]

THE object of these improvements is to economise time and manual labour in the various processes or operations relating to the manufacturing, that is, forming and shaping, of stretchers for umbrellas and parasols out of metal wire. The invention consists in effecting two, three, or more of the operations usually performed separately by hand, at one and the same time, by peculiarly shaped tools, apparatus, or machinery, whereby a great saving of labour is effected, and the necessity of passing the stretchers through the hands of the workman, for every simple operation is obviated; and a rapidity of operation and manufacture is obtained beyond the common system of working by hand.

The Patentee thinks it necessary, in the first place, to remark, that he does not intend to confine himself to the precise forms, dimensions, or constructions shown in the drawings (see Plate V.), as the same may be varied to suit different sized and shaped stretchers; neither does he intend to confine himself to the working of the presses and other apparatus by hand, as the same may be actuated by steam or other power if thought desirable.

After the wire has been prepared into bundles in the usual manner, I first, in one apparatus or machine, cut off the required length for the stretcher, and slit the end which is to form the fork, the wire being first forced through a draw plate or rollers to straighten it. The proper length to form one stretcher is then cut off by a peculiarly shaped tool or cutting punch, which cuts off and forms the ends of two lengths of a curved or rounded form at one time; that is, the "runner end" of the length or stretcher last operated upon, and the "fork" end of the next or succeeding length. The end intended to form the fork is then slit or separated lengthwise, the required distance for the prongs of the fork, and the piece of wire is again moved on under the tools, the proper distance for another length, and the cutting punch and slitting shears again brought into operation, when the last length, with its "fork" end, previously slit, will be cut from off the piece of wire at its "runner" end, thereby producing the unfinished stretcher shown at fig. a; at the same time the rounded shape of the "fork" end of the next or succeeding length is also produced, or the ends of the lengths may be cut off square, as shown at fig. b; and the rounded form of the ends afterwards produced at the time the holes are being punched or pierced.

After the lengths of wire have been prepared in this way, with the " fork" end slit, they are submitted to the *second* apparatus, in which the two separated sides of the end forming the prongs of the fork are forced apart or distended and bent, or formed into the required shape, as shown in the several figures c, d, e, f, g, h; and in this state the unfinished stretchers, with square ends, are submitted to the third apparatus, where the holes are made or pierced for attaching them to the " whalebones" and " runners" of the umbrella or parasol; at the same time, the ends are cut or finished of the proper rounded or curved form.

Fig. 1, is a front elevation of one of the first apparatus or machines which are employed for cutting off the required lengths of wire to form the stretchers and slitting their "fork" ends, which is intended to be worked by rotary motion, communicated to its main shaft by means of a rigger and band passed from a steam-engine or other first mover, or a winch handle, placed on its end, turned by hand. Fig. 2, is a plan or horizontal view, and fig. 3, is a side elevation of the same: *a*, *a*, is the length of wire passing from the bundle placed on a reel in any convenient situation where it will draw off easily to the machine. The wire is first passed through a draw plate, or drawing or straightening rollers, and drawn into the machine by a pair of tongs *b*, *b*, mounted on a sliding plate *c*, moving between the guides *d*, *d*. The toggles *e*, *e*, of the tongs are attached by a pin joint to a lever *f*, worked by the lateral grooved cam A, mounted on the roller shaft B, turning in proper bearings in the framework of the machine C, C; by these means, as the cam A, revolves, the tongs *b*, are made to take fast hold of the wire, and carry it under the cutting die *g*, mounted on the lower end of the vertical piece *h*, and worked by another lever *i*, turning in bearings in the standard D, and actuated by the cam or excentric E, on the shaft B.

On the proper length of wire being carried under the cutter *g*, by the tongs *b*, (as shown by dots in fig. 2,) the cam E, raises the longer end of the lever *i*, and depresses the cutter *g*, which severs the last length or stretcher from the piece of wire, and also forms the rounded end of the next length; at this time the cam E, on the shaft B, comes into operation on the longer arm of the lever *k*, (also mounted in the standard D,) depressing its shorter arm, and with it the piece *l*, which move between the guide pieces *n*, *n*, and brings the cutters together, slitting the "fork" end of the next stretcher to the required length, as will be seen more particularly on reference to figs. 4, and 5, which are representations of the slitting cutters or shears, drawn upon a large scale. Fig. 4, shows the cutters or shears open or apart, and fig. 5, these closed after cutting or slitting the end.

As soon as these operations are effected, the cam G, moves away from the end of the lever *k*, and the cutting shears are again opened by the inclined planes *p*, *p*, on the piece *l*, by means of a weight, suspended by the rods *q*, from the longer end of the lever *k*. As soon as the cutters are open, the cam E, recedes from the end of the lever *i*, and the cutting punch *g*, is again brought up by another weight attached to the rod *r*, to allow of a further length of wire being brought under it by the feeding tongs.

During the operation of cutting off and slitting the length, the lateral cam A, has moved back the lever *f*, first opening the feeding tongs, and carrying them to the position shown in fig. 2, ready to bring in another length of wire as before; thereby keeping up a continuous operation;

the second length being allowed to fall away below, or taken off by hand.

Figs. 6, 7, and 8, are representations of another construction and arrangement of the *first* machine or apparatus used for cutting off the required lengths of wire, and slitting the " fork" end of the stretcher which is intended to be worked. Fig. 6, is a front elevation, fig. 7, is a plan view, and fig. 8, a partial side elevation, showing the manner of working the slitting shears by hand, as a common fly-press: *a, a,* is the length of wire passed through a draw-plate, as before, and brought under the cutting punch by the workman pressing his foot on to a lever or treadle connected to one end of the gut band or chain *b,* attached to the joint pin of the toggles *c, c,* of a pair of feeding tongs *d, d,* similar to those shown in the former apparatus. The tongs are closed upon the wire, and brought forward by the operation of the treadle and cord, and opened and run by a counter balance weight attached to the cord p, into their former position. The cutting off punch *e,* is depressed by the screw *f,* of the fly *g,* which also carries the pieces *h, h,* with the inclined planes *i, i,* closing the cutters or shears *k, k,* and slitting the end of the next length, as before described; the inclined planes *l, l,* opening the shears, or forcing them apart as the screw *f,* rises on the return of the fly, which also brings up the cutting off punch ready for another length of wire being brought under it; there being a part of the punch *e,* removed, as in the former instance, to allow of the shears *k, k,* being brought together or closed. There are also stop pieces *n,* and *m,* for adjusting the proper length of wire required for the stretchers, and determining the motion of the feeding tongs.

After the lengths have been formed as above described, and shown in figs. *a,* or *b,* they are severally taken to the second apparatus, shown in the several sectional and plan views, figs. 9, 10, 11, 12, and 13, where two further operations are performed, viz. the slit ends opened and formed or pressed into the forked shape, as shown in figs. *c*, or *d*. Fig. 9, is a section of the pair of tools or apparatus; the upper tool or shaping punch A, is to be mounted on the end of the carrier of the screw or fly-press, and the lower tool B, in the bed or bolster of the press. Fig. 10, is a plan of the lower die or tool B, showing the prepared end of the length of wire *a*, placed in the lower die D, the ends being placed against the guide or stop piece *b*. Fig. 11, is a section showing the upper tool or shaping die forced down into the lower one by the action of the press, and the prongs of the fork distended and shaped, as fig. *c*, or *d*. Fig. 12, is a plan view of the same; and fig. 13, a transverse section of the lower die.

The prepared lengths of wire as at figs. *a*, *b*, may be separately taken to the other *second* apparatus or pair of shaping tools or dies and punches, shown in figs. 14 and 15, where three of the usual separate operations are performed by the same dies, punches, or tools, viz. the prongs of the fork being opened and shaped as in the former instance, and also flattened at the extremities, as shown in figs. *e*, *f*, for the purpose of distending the metal to allow for the holes being made through them; the outer sides of the upper tool or punch, compressing the sides of the prongs against the insides of the counter die or tool.

Or the prepared lengths, as figs. *a*, *b*, may be separately taken to the other *second* apparatus, tools, or mechanism, shown in figs. 16, and 17, in which four of the usual operations are performed, viz. the prongs opened and shaped, their ends flattened, and curved into the form as when finished and shown in figs. *g*, or *h*.

All of these tools, or apparatus, or die and punches are intended to be placed in common screw presses, and worked in the usual manner by hand or power, and as the mode of fixing up such apparatus is well known to all mechanics, it isn ot necessary to show them placed in the press.

After the prongs or forks of the stretchers have been formed, as shown in fig. *g*, by the foregoing tools or punches, and with rounded ends, the holes for attaching them to the "whalebones" may be pierced in the usual manner by any simple punching press fit for the purpose; but when the prongs or forks of the stretchers have been formed as in fig. *h*, that is, with square ends, then they are submitted to the action of the *third apparatus* or dies and punches, shown at figs. 17 and 18.

Fig. 17, is a vertical section of the tools for punching the holes in the ends of the prongs of the forks, showing one of the stretchers placed therein under operation. Fig. 18, is a plan view of the lower tool or cutting die or punch; A, is the upper tool or cutting die; B, the lower cutting tool or bed; *a*, is the stretcher being guided in its position by the stops or guide pieces *b*, *b*; *c*, is the punch for forming the holes, taking into its counter bed *e*; *f*, is the upper cutting edge or tool which cuts off the superfluous part of the end against the rounded counter edge of the bed *e*, after cutting and punching the ends of one of the prongs, the stretcher is reversed and the other prong brought under operation, and pierced and finished as with the former, producing the finished stretcher as at *i*, after having been flattened in the usual manner. The reverse or runner end of the stretcher is then placed in the dies or tools, as shown in figs. 19 and 20, and is similarly operated upon.

The same letters of reference being marked upon similar parts, as in figs. 18 and 19, no further description will be necessary.

The Patentee says, in conclusion, having now particularly described and ascertained the nature of my invention, and the manner of carrying the same into effect, I wish it to be understood that I do not mean or intend to claim as part of my invention any of the tools, apparatus, dies, or punches, for simply punching the holes in the ends of the stretchers, or for performing any one part or single operation in the making or manufacturing of umbrella or parasol stretchers, but that which I claim as my invention; of certain improvements in the making or manufacturing umbrella and parasol stretchers, is the combining of two or more of the usual operations commonly performed separately by hand in one operation or working of the apparatus, o rmechanism, tools, or dies, and punches, as above described.—[*Inrolled in the Rolls' Chapel Office, October,* 1836.]

Specification drawn by Messrs. Newton and Berry.

To JAMES DIGGLE, *of Bury, in the county palatine of Lancaster, engineer, for his invention of certain improvements in steam-engines.*—[Sealed 8th March, 1836.]

THESE improvements in steam-engines consist, in the first place, in a peculiar arrangement of the parts of low-pressure condensing stationary steam-engines, by which arrangement the ordinary beam or main lever is dispensed with, and the whole of the engine is erected in a much more convenient and compact form; and this is effected by placing the air pump below or under the steam cylinder in a direct line therewith, whereby the piston of the steam cylinder and the bucket of the air pump can be worked at the same time by means of one piston rod passing through both ends of the cylinder. Secondly, in constructing the ordinary D or square slide valves for the ingress and egress of the steam to the cylinders of engines with metallic packing, rendered elastic, or yielding by means of the application of wedge-formed pieces, and springs as hereafter described.

In order to elucidate the particular features of novelty claimed under this patent, the inventor has shown in the drawing accompanying his specification, sufficient portions of the improved steam-engine to render the improvement intelligible, and also different views of the common D valve for steam-engines, in all of which figures the same letters of reference point out corresponding parts.

Plate VI. fig. 1, is a sectional side elevation of the improved steam-engine; and fig. 2, a front view of the same, also partially shown in section: A, is the steam cylinder; B, the piston; C, the air pump; D, the condenser: E, E, the sliding valves; *a, a,* are the standards or side frames of the engine, supported upon suitable foundations of stone or other material; *b, b,* is the crank shaft, carrying its fly wheel, and turning in proper bearings or plummer boxes on the standards, through which shaft the power is communicated from the steam cylinder to the machinery required to be driven by the engine. At one end of this shaft the crank *c,* is mounted, being immediately over the central line of the steam cylinder. The crank is connected by its pin to the rods *d, d, d,* which are jointed at their lower ends to a cross piece *e,* firmly secured to the piston rod *f*; and as this rod works up and down through the guide piece or stuffing box *g,* fixed to the framing of the engine, the requisite parallel motion is obtained, that is, the direct vertical ascent and descent of the piston rod.

It will be seen that the piston rod works through the stuffing box formed in the cover of the cylinder, as usual, and extends through the piston B; and another stuffing box in the bottom of the cylinder at its lower end being attached to the air pump bucket *i*, works in the air pump C.

The slide valves E, E, for the admission and exit of the steam to the steam cylinder, are worked by the rod *m*, and excentric *n*, on the main shaft *b*.

The second feature of novelty, is more particularly shown in figs. 3, 4, 5, 6, and 7; fig. 3, being a front or face view of the slide valve detached from its steam chamber, the metallic packing of the same being removed; fig. 4, is a back view, and fig. 5, a vertical section taken through the valve and its metallic packing in the line *a*, *b*, to show the wedges and springs. Fig. 6, is a horizontal section of the same in the line *c*, *d*; and fig. 7, is a plan or horizontal view of the valve, as situate in its steam chamber, which is shown in section; *p*, *p*, are the metallic segments or packings, and are severed into portions where the wedge formed-pieces *q*, *q*, are placed.

It will be perceived that these segments or packings are rendered elastic by means of the wedges *q*, *q*, being forced by the springs *r*, *r*, into the division of the segment of packing. The springs placed behind the wedges, and bearing against the D valve, may be of the form represented in the drawing, or they may be helical, elliptical, or of any other suitable form. The segments of metallic packing are kept in their proper position by the semi-circular piece *s*, *s*, which is screwed or bolted to the bosses *t*, *t*, *t*, projecting from the bottom piece or plate *u*, *u*.

Having described the principal features of improvement considered to be new, the Patentee says, I wish it to be understood that I do not claim separately any of the various parts of a steam-engine which have been herein described. I claim as my invention, first, the above described combination and arrangement of the various parts of low pressure or condensing steam-engines; and, secondly, the application of the above described elastic metallic packings to the steam valve, known by the name of the D valve or square valve when applied to engines upon either the high or low pressure principle, and whether stationary or locomotive.—[*Inrolled in the Rolls Chapel Office, September*, 1836.]

Specification drawn by Messrs. Newton and Berry.

To WILLIAM KEMP, *of Burslem, in the county of Stafford, teacher, for his invention of a machine for raising sunken vessels.*—[Sealed 23rd April, 1835.]

THIS is a modification of the apparatus commonly employed for raising sunken vessels. In the ordinary mode of proceeding to raise a vessel from under water, a number of casks are filled with water and sunk down to the sides of the vessel, to which they are made fast by chains; air is then injected into the casks, for the purpose of expelling the water, by which means the casks become buoyant, and in rising to the surface of the water bring the sunken vessel up with them.

The explanation given by the Patentee of his improvement, though not very well expressed, will be understood. He says, "My invention relates to a machine for raising heavy bodies from the bottom of water, so contrived and constructed that it may be applied and regulated, that sunken vessels of any tonnage may be raised from any depth to the surface of the water." Perspective representations of the improved apparatus are given in two positions (see Plate VI., figs. 8, 9, and 10,) which are thus described :—"*a*, is a vessel of wood, copper, or any other material, made perfectly air-tight, and strong enough to bear being filled with water without any danger of its bursting. It has the lower end open, for the purpose of admitting air within; *b*, is an end or bottom, made of a material that will always float, and so constructed that it moves easily up and down inside the vessel, but is prevented coming out by a projecting edge or ledge *c*. at the lower end withinside; and there is a safety valve to prevent the air, when rising and expanding, from bursting the vessel, if at any time it should be overcharged.

"A gauge is employed for determining the quantity of air in the vessel, which is composed of two lines similarly divided or marked. At the end of one of the lines, which runs easily through a groove, is a hollow ball, which is placed within the vessel *a*, and, consequently, will float on the top of the water within the vessel; the other line has one end fastened to the groove. By comparing the two outer ends of the lines, which are long enough to reach to the surface of the water, the exact space occupied by air within the vessel *a*, may be ascertained." This we do not at all understand.

The method of using this machine is described to be by first filling it with water, and then sinking it down to the body intended to be raised, and firmly fastening it thereto by chains, the open end of the vessel being downward. This is to be done by persons under the water, stationed in a bell, or other diving apparatus.

The loose bottom of the vessel being made of a material which will float, the pressure of the water will raise it up to the top of the interior as the vessel descends; and the gauge being fastened to the lower end of the vessel, the machine is then ready to be charged with air, which is to be done by an air pump, the air being conducted from the pump under and into the vessel by a descending pipe.

When the air enters the vessel *a*, it naturally displaces the water therefrom at the top withinside, and the moveable bottom, which will always float upon the water within the vessel, will, with the water, gradually descend.

When a sufficient quantity of air has been forced into the vessel *a*, which, the Patentee says, " must in no instance exceed the quantity of air that will fill the vessel, and when the top of the vessel is at the surface of the water, the machine is then fully charged, and it will then lift the greatest weight that it possibly can raise to the surface of the water. Another machine may then be treated in precisely the same manner, and so on until as many are charged with air as will overcome the extra gravity of the body to be raised above that of the water. As soon as such is the case, the whole mass, machines, vessels, and all, will gradually rise to the surface of the water."

The Patentee says, in conclusion, " Having described the nature of my invention, and the manner of carrying the same into effect, I would remark, that I am aware that it is not new to apply air in vessels for raising sunken vessels; I do not, therefore, claim the same generally, but confine my invention to the application of vessels open at one end, having the means of regulating and indicating the quantity of air, as above described, when used for raising sunken vessels."—[*Inrolled in the Inrolment Office, October,* 1835.]

To William Blurton, *of Field Hall, near Uttoxeter, in the county of Stafford, gentleman, for his invention of an improved method of, and apparatus for, extracting milk from cows and other animals.*—[Sealed 26th March, 1836.]

This invention has for its object the capability of extracting milk from cows in a more expeditious manner, and with less labour than by the common process of milking by hand. It consists, simply, in distending or opening the passages of the teats of the cow, or other animal, by the introduction of small hollow probes or tubes: these tubes keep open the passages, by forcing back the muscles which otherwise retain the milk in the udder, and thereby allow the milk to flow freely from out of the udder down the hollow probes, pipes, or tubes, into the receptacle placed to receive it.

It is well known that the action of the common process of milking by hand, is simply to squeeze out that portion of the milk which is contained immediately in the teat, the pressure of the fingers of the milker overcoming the force of the sphincter muscles, or those which contract or close up the orifice of the teat; and on removing that pressure, these muscles again close the passage, and a fresh portion of milk enters the teat, which is then squeezed out by similar means until the udder is emptied, when the operation of milking is completed. By the improved method and the improved mode or method of extracting or obtaining milk from cows and other animals, by distending or opening the mouth or orifice of the teat, by keeping the sphincter muscle distended or forced back during the time the milk is running out of the udder; and also the improved apparatus above described for this purpose, viz. the hollow probes, tubes, or pipes, which effect the keeping open of the orifice of the teat, and form a free passage for the milk to flow out of the udder; the admission of air into the udder being at the same time prevented.—[*Inrolled in the Rolls Chapel Office, September,* 1836.]

Specification drawn by Messrs. Newton and Berry.

To SAMUEL GARNER, *of Lombard-street, in the city of London, gentleman, for an improvement in the art of multiplying certain drawings and engravings or impressions, being a communication from a foreigner residing abroad.*—[Sealed 15th November, 1834.]

THE subject of this invention is the formation, preparation, and treatment of plates of zinc, in order to suit them more perfectly than has been heretofore done to the purposes for which slabs of stone are used in lithographic printing, but in the present state of that art, which may now be called zincography, preference is given to metal of the purest quality.

When it is deemed desirable to give to the metal greater density than it possesses in its simply cast form, the improved plates are to be subjected to the pressure of a pair of metal rollers, passing them through at a temperature at which the metal is malleable, alternately in the direction of the length and breadth of the two superficial dimensions of the plates, in order to prevent the metal from taking a fibrous texture, as it does in some degree when repeatedly rolled in only one direction. The action of the rollers thus managed produces a more uniform condensation of the metal than can be effected by planishing with the hammer.

The cast plates, whether subsequently laminated or not, are to be brought to an accurate uniformity of thickness, by being planed on one or both of their faces by a planing engine, such as is now commonly used for planing the surfaces of other metals, by which means an accurately flat working face is obtained, which conduces essentially to the more certain and uniform action of the press in the operation of working off the impressions.

To render the surface of the metal better adapted to receive the subject to be delineated thereon, it is advisable to impart to it a certain roughness, termed technically a grain: this is effected by rubbing the surface with some cutting substance in a pulverulent form, such as silicious sands, emery, stone, or marble-dust, pounded pumice, rotten-stone, charcoal-powder, or other such materials, having the requisite property of abraiding the metal. Some such substances may be used for the purpose in masses or lumps, as pumice-stone, charcoal, &c.

These materials may be employed with water, or other non-solvent liquid, being rubbed upon the metal surface in all directions, until an uniformity of grain is produced. Two plates may be used to grind each other, or a muller may be employed, or leather, or other soft substance, may be the instrument for the application of the cutting powder to the metal, and the fineness or coarseness of the grain desired to be produced, will of course determine the sort of material proper to be used; but in all cases it must be guarded against applying matters of such coarseness as will cut deeply into the plate, it being the object to produce a slight roughness of surface in a regular grain.

Sometimes, perhaps, it may be useful to give a different grain to different parts of the same plate, with a view to accommodate the artist in assisting to impart a variety of character to his work; this can be done by using the grinding materials of different qualities in different parts of the plate, conducting the operation by hand, with such partial applications as may be desired.

The grinding being completed, the material must be washed off, and the plate cleansed from impurities, to prepare it for the reception of the writing or design which should be done with a solution of alkali, either potash or soda, caustic or sub-carbonated.

The lines or traces to be printed from the zinc plate, are to be made thereon by similar materials and preparations to those used for the like purposes in the art of lithography; and this being done either by hand or by transfer, the plates are to be fixed and prepared for the subsequent operations, and brushed over the surface with an acid liquor, such as the one prepared in the following manner:—Boil in a pint of water about one ounce and a quarter of bruised gall-nuts until the fluid is reduced one-third; pass the decoction when cool through a sieve or fine linen strainer, to separate the clear liquor: to which add about two fluid drachms of nitric acid, and three or four drops of muriatic acid. This may be varied as to the proportions of the acids, according to the nature or strength of the work to be produced; a weaker solution of acid will best suit the more delicate work.

The acid liquor may be brushed over the work with the tool ordinarily employed for such purposes, and it may be left to act thereon, and on the metal for a longer or shorter time, according to the strength of the lines or work to be fixed; a few minutes will commonly suffice, but no injury appears to result from a longer time. The plate should then be washed with clean water to free it from the acid, and then the work may be covered with gum water, as is done on stone.

Other acidulated liquors than the one above described may be made use of for fixing the work upon the plate; such as any diluted acid, the action of which on the metal will be moderate—or solutions of many of the super-acid salts; for example, muriate, or nitro-muriate of tin; but for general purposes, the Patentee prefers the preparation above described, and claims to use, where convenient, for special purposes, any other form or preparation of acidulated liquor.

The zinc plates prepared and treated in the way herein described, answer for the reception and re-delivery, by impression, of all the different kinds of work now usually executed by means of stone, in the art of lithography, and equalling the stone in all the properties dependant on surface; they have also the great superiority of being able to bear the action of other kinds of presses, than those which have been especially adapted to the working off impressions from stone. The copper-plate roller press, the ordinary type press, and others giving adequate pressure over the whole surface of the plate, may be employed with due effect in taking impressions from the zinc plates.

The Patentee concludes by stating his claim of invention in the following peculiarly constructed sentence:—" In the processes herein described, for the formation, preparation, and treatment of plates of zinc, to fit them more effectually than they have heretofore been found, for the purpose of multiplying copies by printing of lines, traces, or markings, made by certain materials upon their surfaces consecutively used as now indicated, either to the whole extent or partially, by the omission of some one or more of the processes; for instance, condensation of the metal between rollers, or modified, as by change of material, to produce certain effects; for instance, graining and fixing the lines or design upon the metal, consists the invention for which I have obtained the grant of the herein partially recited Letters Patent."—[*Inrolled in the Inrolment Office, May,* 1836.]

To THOMAS RIDGWAY BRIDSON, *of Great Bolton, in the county of Lancaster, bleacher, for his invention of a certain improvement or improvements to facilitate and expedite the bleaching of linen and other vegetable fibres.*—[Sealed 7th April, 1836.]

THESE improvements in bleaching linen and other fibrous substances, have for their object the expedition of the process, by means of performing all the operations between the first and last wheeling in one vessel or kier, thereby avoiding the loss of time attendant upon the usual process in conveying the goods between each operation from one vessel to another.

Plate VI., fig. 11, represents the section of a kier suited for the above purpose; fig. 12, is a plan or horizontal view of the same: *a, a,* is a kier, composed of any material that will not be affected by the action of the chemical agents employed in the process; *b, b,* is a false bottom, perforated with a number of holes, for the purpose of allowing the drainage of the different solutions to be admitted to the materials under operation; *c,* is a pipe proceeding from a boiler or other source, for the purpose of conveying steam, when required, to the chamber *d*; *e, f, g, h, i,* are pipes, provided with cocks, for the admission of alkaline, chloride, and sour solutions, hot water and cold water; *k*, is a pump, actuated in any convenient manner, and communicating at its lower end with the chamber *d*, and at its upper end with the kier *a*, *a*.

After the first operation of wheeling the material to be operated upon (which the Patentee supposes in this case to be about one thousand eight hundred weight of shirting) is placed in the kier *a*, *a*, around the pump *k*, the bowking process then begins, which is done by opening the cock *e*, and admitting the alkaline solution. If soda-ash be used for this purpose, of 50 per cent. of free alkali, it is stated that 600 ounces of the soda-ash to as many gallons of water, will be a suitable proportion: steam is then to be admitted from the pipe *e*, into the chamber *d*, for the purpose of raising the temperature of the solution to about the boiling point; and the pump *k*, being put into action, it will be carried from the chamber *d*, (into which it has passed through the perforated bottom), and conveyed again unto the surface of the material in the kier, and from thence pass to the chamber *d*, constantly circulating in this manner, until the operator perceives that the bowk is completed (the Patentee states about nine or ten hours will suffice); the cock *m*, is then opened, which discharges the ley from the chamber *d*.

After this process is completed, the cock *h*, is to be opened, which admits a circulation of hot water, for the purpose of washing the goods from the alkaline ley: cold water is now to be admitted from the cock *i*, as a medium for reducing the goods to a proper temperature for the reception of the chloride solution, which is to be introduced by the pipe and cock *f*.

The Patentee states, that if this solution consist of chlorate of lime of about 23 parts chlorine, 600 gallons of water may be used to about 15 lbs. This solution is to circulate, as in the former instance, by means of the pump, for about five hours, when the cold water is again to be admitted for the purpose of clearing the goods from the chemical solution. The sours are then to be introduced from the pipe *g*, and if it consist of sulphuric acid of 170° strength on Twedelle's hydrometer, about 40 lbs. to 60 gallons of water will be about the proper proportion. After this solution has been circulated, as in the former instances, the goods are to be again washed by cold water, when they may be taken from the kier to the wheel, and treated in the usual manner.

In conclusion, the Patentee remarks, that he is aware the apparatus may be varied in different ways, so as to accomplish the same object; for instance, instead of the kier being made as represented in the figure, it may be constructed like a drum, and made to turn upon a hollow shaft or axis, through which the steam may be admitted, the circulation of the solutions being kept up by the revolution of the kier; and also that the solutions may be varied in strength to suit the different quality of goods to be operated upon: he does not, therefore, confine himself to the precise apparatus here shown; but claims the invention of operating upon the goods in the different processes between the first and last wheeling, in one kier or vessel, and also the use and application of the solutions, as above described.—[*Inrolled in the Inrolment Office, October,* 1836.]

To GEORGE FREDERICK MANTZ, *of Birmingham, in the county of Warwick, roller of metals, for his invention of an improved manufacture of boilers used for the purpose of generating steam.*—[Sealed 28th October, 1833.]

THIS invention consists in the employment of plates made from an alloy of copper and zinc, for the construction of steam boilers. The Patentee refers to the specifications of two patents granted to him, the one dated 22nd October, 1832, the other, 20th November, in the same year (see vol. iii. of our present Conjoined Series, pp. 83, 212), in both of which the constituent parts of the alloy are described.

The proposed proportions of the compounded metals are of the best selected copper and good zinc, equal quantities, or in the extremes, sixty-three parts of copper to thirty-seven of zinc, which are to be melted together in the usual manner, and may, in these proportions, be worked at a red heat: but the most approved proportions are, sixty parts of copper to forty parts of zinc.

This compound is to be cast into ingots of any convenient weight, which, when heated to a red heat, are to be rolled into sheets, or hammered into forms, in the same way as copper is commonly rolled and hammered, care being taken not to heat the metals to fusion, nor to work it after its temperature is too much reduced.

An alloy may be made for the same purpose, from a compound of copper and calamine, by cementation; but care must be taken, that the quantity of calamine used shall be sufficient to allow of the zinc to be extracted from it, equalling the proportions above stated.

Brass, of very good quality, with the addition of zinc, sufficient to make an alloy in the above proportions, will do, and is capable of being rolled and worked when red hot; but both these are more expensive than the first described.

The said alloys may be made into bolts and rivets, and drawn into pipes, which is necessary for the manufacture of steam boilers. The Patentee, therefore, claims under this patent the employment of the said alloys for the entire manufacture of boilers for generating steam, which may be made more light, durable, and cheap, than if constructed entirely of copper.—[*Inrolled in the Inrolment Office, April,* 1834.]

To Thomas Aitkin, *of Edenfield, in the parish of Bury, in the county of Lancaster, spinner and manufacturer, for certain improvements in the preparation of cotton and other fibrous substances, and in the conveyance of the same to roving frames, mules, throstles, or any other spinning or doubling machinery.*—[Sealed 26th April, 1836.]

This invention consists in coiling and closely packing ordinary slubbings or rovings of cotton, or other fibrous material, in cams or other convenient receptacles, in the place of winding them on to bobbins, as heretofore has been commonly practised ; and which cams, containing the preparation of cotton, or other fibrous material, are proposed to be substituted for and used in the place of the ordinary bobbins mounted upon a reel, from which roving frames, and also mules, throstles, and other spinning machines, have hitherto been fed or supplied with slubbings of cotton, or other fibrous material.

For the more perfect illustration of this improvement to those who are not fully conversant with the practice of cotton spinning, as now commonly performed, the Patentee thinks it may be necessary to state that slubbings of cotton are loose stripes or bands of fibre immediately after it has undergone the process of carding and drawing; and that "rovings" are composed of one, two, or more of these stripes or bands of slubbings combined, in a doubling or twisting machine, commonly called a "roving" frame.

These roving frames, and the subsequent spinning machinery, are generally fed or supplied with bands of fibres, of cotton slubbings, or rovings wound upon bobbins, which are placed upon creels for that purpose. In the present system of roving and spinning from slubbings and rovings wound upon bobbins, the roving or yarn is necessarily composed of only one, two, or, at most, three bands of slubbings or rovings, owing to the impracticability of feeding from any greater number, from want of space to set the bobbins; but in this improved plan of preparing cotton, and feeding such machines, it will be seen that any number of bands or strands of slubbings or rovings may be placed together in one can, and set behind the roving or spinning frames, and, consequently, the roving or yarn may be made of any required number of slubbings or rovings.

Now to show the great saving of time and labour which is commonly expended by children in attending the various frames or machines to re-place those bobbins which have been exhausted of their material with full bobbins, it is only necessary to state, by way of example, that to produce what is termed a four hanks' roving, the bobbins of ten inches long and five inches diameter must be changed fourteen or fifteen times per week throughout the whole machine, whereas, by the plan proposed by the Patentee, viz. to pack the material closely in cans of about thirty-two inches high and five inches in diameter, each can will contain sufficient cotton (that is, eight pounds,) to supply the said machines with one week's stock, without requiring any alteration or re-placing of the cans, and at the same time the yarn produced will be much superior, less subject to piecing, and make considerably less waste, beside being kept entirely free from dust and damp by its enclosure within cans, instead of being exposed upon the surfaces of bobbins; and in addition to this, a great advantage will result by the creels being removed, so as not to obstruct the light in the factory.

The second feature of novelty claimed, is the mode of packing and pressing the slubbings or rovings of cotton, or other material, into the cams which have been prepared to receive them; and this part of the improvement will be fully illustrated by reference to the accompanying drawings (see Plate VI.) Fig. 13. is a section taken transversely through the doubling machine, which is proposed to be used to double the slubbings or rovings into the cans, after passing from the bobbins upon which they have been previously wound in the slubbing and roving frame.

It is evident that these machines may be so arranged that any required number may be placed side by side; and it is preferred that they shall not be connected, in order that each machine may be stopped or removed individually without affecting the other machines. The upright standards and cross rail forming the framings of the machine, are shown at *a, a,* carrying the main or driving shaft *b,* which extends through the whole set of the machines from end to end, carrying the driving pulley *c.* Smaller pulleys *e, e,* are also fixed upon the main shaft *b,* carrying straps *f, f,* which drive the pulleys *g, g,* on the ends of each of the lower rollers of the pair of doubling or drawing rollers *h, h.*

The slubbings of cotton are severally conducted down from the bobbins which are placed above at *j, j,* and are in a combined form passed through the trumpets or mouth pieces, and between the rollers *h, h*; and after being laid evenly, and thereby united together, they proceed downward into the tin cans or receptacles *l, l,* in which, after being so collected, they are to be taken to the roving frames, or other machine, and wound upon smaller bobbins, when they are called rovings; and these rovings may be again taken and passed through my improved doubling machine, and packed into cans ready to supply the mules and throstles to complete the operation of spinning.

The tin cans *l, l,* are placed upon discs or circular plates of metal formed with a groove cut in their peripheries, for the purpose of being slowly turned round during the time they are filling with slubbings, in order that the slubbings may be laid evenly therein, and after every revolution of the cans they may be turned the reverse way, in order to prevent the fibres becoming twisted; but if a small quantity of twist should be required in the rovings, the cans may continue revolving one way only, which will effect the twisting desired. This revolution of the cans, which is to be very slow, may be effected by a worm upon the main shaft taking into a wheel carried by an upright shaft having a small pinion at its other extremity running in a common mangle wheel, and by that means the driving the pulleys upon which the tin cans are placed will be carried round it, or may be effected by any other convenient means.

When the cans have become apparently filled with slubbings or rovings of cotton, or other fibrous material, the contents are to be pressed down by hand, or by any convenient contrivance for this purpose, which may be worked by hand, or made self-acting by its connexion with the doubling machine; and when the cans have become filled as much as the ordinary pressure of the hand will allow, two or more of them are to be submitted to the more powerful pressure of a common rack, screw lever, or any other press, when the cans having false bottoms will allow the contents of two or three to be pressed into the undermost one, which will be provided with a fast bottom; and this can, with the cotton in its compressed state, may then be taken away to supply the roving frames or other spinning machinery, as before said, and from which it will be found that the slubbings or roving will draw much easier and better than from bobbins, as heretofore used.

It is evident that it will be perfectly unnecessary to recapitulate what has been before said, in order to constitute my claim to protection in the pressing and supplying of the slubbing or roving under the above in part recited Letters Patent; but it may, nevertheless, be necessary to state, that I do not intend to confine myself to the precise mode or means of accomplishing or effecting the object which has been above fully explained.—[*Inrolled in the Rolls Chapel Office, October*, 1836.]

Specification drawn by Messrs. Newton and Berry.

To JOHN COOPER DOUGLAS, *of Great Ormond-street, in the county of Middlesex, Esq., for certain improvements, which prevent either the explosion or the collapse of steam or other boilers from an excess of internal or external pressure.*—[Sealed 19th November, 1833.]

THERE are two schemes proposed under this patent, for preventing the explosion of steam boilers, the first of which is a small auxiliary cylinder and piston, connected with the boiler, which piston being raised by any extraordinary pressure of the steam within, depresses one end of a lever, connected to the safety valve, which immediately gives vent to the steam; the second is denominated a "pneumatic or hydraulic apparatus," which is designed to introduce a quantity of water into the boiler, in the event of gas or vapour being suddenly generated in the lower part of the boiler.

The Patentee says, "My improvements may be said to consist of two distinct arrangements for insuring safety to boilers, generators, cauldrons, stills, or other vessels, subject to changes of pressure, whether external or internal, by increase or decrease of temperature, or otherwise."

Plate VI., fig. 14, represents part of a steam boiler, with the improvements attached thereto: *a*, is a small cylindrical chamber, placed upon and open to the interior of the boiler, in which chamber a small piston is allowed to slide. To the upper end of the piston rod two small chains are attached, which pass from thence under pulleys, and are attached at their reverse ends; the one to a lever *b*, the other to a helical spring *c*. The lever *b*, is mounted upon a standard *d*, and carries the stem of the safety valve *e*; the spring *c*, is suspended from a small standard or bracket *f*. When the internal pressure of the steam is so great as to require vent, the piston in *a*, will be forced upwards, and in rising will draw the chains depressing the longer arm of the lever *b*, and thereby raising the safety valve *e*, from its seat, which immediately gives the vent required. The spring *c*, is called a sort of steelyard or weighing apparatus, acting as a balance to keep the piston rod erected, and also showing the amount of internal pressure.

As regards the second feature of the improvement, the Patentee says, that he has from long experience and observation, been led to believe that some explosions are attributable to other causes than the force of the steam, and has provided for such peculiar causes by the apparatus shown at *g*, *h*, *i*, &c. " These latter causes of explosion I attribute to the water being raised up from the bottom of the boiler, by the rapid formation of elastic vapour, which cannot with sufficient rapidity pass up through to the surface of the liquid; and such an elastic vapour being a bad conductor of heat, becomes more highly charged with heat, and with the greater power repels and drives upward the liquid, forcing the steam off by the valve, and sometimes the water also: when in such cases the valve is shut, the deflected forces cause a showering of the upper and cooling fluid amongst the lower or hotter elastic vapour, by which this hotter elastic vapour is condensed, or partially condensed, and the pressure is thus suddenly reduced below the pressure of the atmosphere; I therefore provide the low-pressure boiler with a supply of water ready to rush in below when this reduction of pressure takes place in the inside; and I provide the high-pressure boiler with a supply of air to rush in.

" In low-pressure boilers I use the arrangement of cisterns shown at *g*, *h*, *i*, &c., in fig. 14. When the internal pressure is too little, and a collapse likely to happen, the hanging valve *i*, will be pressed open by atmospheric pressure, and water from the cistern *h*, will flow into the boiler along the pipe *g*. For keeping the cistern *h*, well supplied with water, I use the common float apparatus, by which means water is permitted to flow down *k*, from the upper cistern *l*, when required in the cistern *h*.

" In some situations, and particularly in steam boats, a mere pipe and valve from the bottom of the boiler leading into the water would answer the purpose for either high or low pressure, and may then be better than the cisterns *k*, and *l*. In high-pressure boilers I prefer using the arrangements of a pipe and valve with signal bell, shown in fig. 15, and air is pressed in through the valve and pipe when necessary to prevent a collapse. The signal bell is intended to warn the engineer that such change has taken place. In some situations I prefer the air-pipe valve and bell to be arranged, as fig. 16.

" I have now described my improvements, which prevent either the explosion or collapse of steam or other boilers from an excess of external or internal pressure, in such manner as to enable persons conversant with works of a similar nature to practise the invention; and I do hereby declare, that I do not claim as my invention the use of a steel yard, spring balance, or other meter of pressure; but I claim as my invention that construction and arrangement of a piston and cylinder, whereby the increase or decrease of pressure within a vessel may be made available for moving any of the safety valves now in use.

"I do not limit myself to any arrangement of connecting chains, connecting rods, or other connexion or constructions of apparatus between the piston and the safety valve, and I do not limit my claim to any particular kind of boiler; neither do I claim as my invention the use of valves opening inwards, which have been extensively used in the country for some years for the greater safety of boilers when they are cooling; as my claim is for the construction, application, and use of such valves and tubes opening inwards at the bottom of boilers (whatever be the position of such apparatus and valves), for the purpose of counteracting the effect of those particular changes which I have observed to go on more or less in all boilers; and I do not limit my claim to that form and construction of the apparatus which I have thought it advisable to describe above." — [*Inrolled in the Inrolment Office, May,* 1834.]

PLANING MACHINES.

In reference to an article which appeared in our last, on the subject of Whitworth and Co.'s improved machinery for planing iron, the Editor begs to say, that he endeavours to avoid as much as possible making the pages of this Journal a vehicle for trading advertisements; and knowing the very favourable aspect in which an inventor naturally views his own productions, he has always been anxious that every notice of improvements in the arts and manufactures should emanate from his own pen, and not from any party who may be personally interested in the matter.

In consequence, however, of the Editor's absence from London, the article above alluded to was written and inserted without his knowledge; and it appears, as might be expected, has given very considerable offence to the very highly respectable and talented firm of Sharp, Roberts, and Co., of Manchester.

Without intending in any degree to detract from the merits of Messrs. Whitworth and Co.'s improvements, the Editor considers that the writer should at least have been silent as to a comparison of advantages over any other rival machines, and exceedingly regrets that any friend of Messrs. Whitworth and Co., or of his own, should have been so injudicious as to have communicated to a public journal a highly-wrought statement calculated to serve one party to the prejudice of another.

We have received letters on the subject from Messrs. Sharp, Roberts, and Co., and from Messrs. Whitworth and Co., which we here insert, trusting that this will be considered by both as the *amende honorable*.

"*To the Editor of the London Journal of Arts, &c.*

"Manchester, Oct. 22nd, 1836.

"Sir,—Your Journal for this month contains an article on the Planing Machine, lately patented by Messrs. Whitworth and Co., of this town, which we read with extreme surprise, not unmixed with other feelings; and as the statements therein made are calculated to mislead the public, so far, at least, as the influence of our judgment respecting the merits of the machine may be concerned, we rely, as an act of justice to the public and to us, on your inserting this communication in your next Journal.

"The article referred to contains, amongst others, the following bold allegations, viz.:—that 'the machine of Messrs. Whitworth and Co. not only produces a better surface than others, but effects a saving of one-half the power, labour, and time hitherto consumed!'

"With respect to producing a better surface than other machines, we have no hesitation in declaring our opinion, that the allegation is not only unsupported by, but is contrary to fact; and equally so is the statement that the machine effects a saving of power to the extent declared.

"As regards the alleged saving of one-half the labour and time hitherto consumed, we have to state that, having attentively observed the operation of two of the patent machines for a considerable time, we are decidedly of opinion that a workman can perform a greater quantity of the most general kind of work in a planing machine, as previously constructed, than he can in one of the patent machines of the same dimensions.

"In reference to the unqualified assertion that the 'reversing tool,' which constitutes the chief feature of the invention, has been successfully applied to a large machine in our establishment, and that the 'fact speaks volumes in favour of its merits,' we have to state that the assertion is entirely groundless.

"Some time in the month of September, a proposal was made to us by one of the Patentees, to apply the 'reversing tool,' to one of our machines; but we stated to him our opinion, that the application of the 'tool' would not be attended with any practical advantage, but, on the contrary, more probably, with disadvantage, and therefore declined acceding to the proposal.

"We regret that necessity should have existed for our addressing to you this communication; but after the insertion in your Journal of the injudicious article referred to, we deemed it equally an act of duty to the public and to ourselves, to correct, at an early period, the erroneous impressions which the article was inevitably calculated to produce.

"We are, Sir,
"Your obedien Servants,
"Sharp, Roberts & Co."

"*To the Editor of the London Journal of Arts and Sciences.*

"Sir,—In the notice you were pleased to take last month of our planing machine, it has occasioned us much concern to observe a material error which we beg you to correct in the forthcoming number of your Journal. You have stated, as a proof of the excellence of our patent machine, that an important part of it, viz. the reversing tool, has been applied by Messrs. Sharp and Roberts, of this town, to one of their own machines. This is incorrect, the fact being, that we applied the improvement ourselves to a machine of Messrs. Sharp and Roberts, made for us by them some time ago, in the commencement of our concern, and which is now at work on our premises.

"We have the satisfaction of knowing that our improvements will be, ere long, very generally introduced; but Messrs. Sharp and Roberts have not, as yet, given them the sanction of their adoption.

"We are, Sir,
"Your most obedient Servants,
"Jos. Whitworth & Co."

SCIENTIFIC NOTICE.

AGE OF PEAT MOSSES.

At the fifth meeting of the British Association for the Advancement of Science, at Dublin, Professor Babbage brought forward a plan for ascertaining the age of peat mosses by annual layers of the trees found in them. If, for instance, there were two wide rings separated by a narrow one, it would show that at some period two years of favourable growth had been divided by one unfavourable year; and it is possible that by observing similar rings in some very old trees still standing, we might be able to ascertain the period of their growth to have been the same as that of the timber found in bogs or mosses. The American Journal says, "This subject, as far as the growth of trees, was ably illustrated by Mr. A. C. Twining, in a notice in this Journal. There can be no reason to doubt that this opinion is well founded, and we have now lying before us decisive evidence that ligneous layers were deposited of a very different thickness in different seasons in ancient as in modern times. We allude to a section of a fossil tree from Antigua, which we have caused to be cut and polished; its diameter is eleven inches by six, and its surface about sixty square inches. It presents the annual layers with the most perfect distinctness, as much so as recent wood of any kind whatever. These layers vary in thickness from one-fourth or one-third of an inch to one-fifteenth or even one-twentieth of an inch; there are about fifty layers, indicating, according to common opinion, the same number of years; and in some parts several thin layers, and in others several thick ones, succeed each other, and in other parts thick and thin alternate, indicating all the variety of seasons that exist now on the earth."

List of Patents

Sealed in Scotland since 22nd August, 1836.

To John Sharp, of Dundee, flax-spinner, for certain machinery for converting ropes into tow, and certain improvements in preparing hemp or flax for spinning, also certain improvements in certain machinery for the preparation thereof for spinning, part of which improvements are also applicable to the preparing of cotton, wool, and silk for spinning.—24th August.

— James Champion, of Manchester, machine-maker, for certain improvements in machinery for spinning, twisting, and doubling cotton, and other fibrous substances.—31st August.

— John Springall, of Oulton, Suffolk, iron-founder, for an improved mode of manufacturing certain parts of ploughs.—2nd September.

— Richard Thomas Beck, of Little Stonham, Suffolk, in consequence of a communication made to him by a foreigner residing abroad, for a new or improved apparatus or mechanism for obtaining power and motion to be used as a mechanical agent generally, which he intends to denominate rotæ vivæ.—10th September.

— Henry Scott, junior, and Stephen Oliver, of Edinburgh, hatters, for a certain improvement or improvements in the manufacture of hats, caps, and bonnets.—10th September.

— Elisha Hayden Collier, of East India Cottage, City-road, London, civil engineer, for an improvement or improvements in steam-boilers.—20th September.

— William Barnett, of Brighton, Sussex, for certain improvements in apparatus for generating and purifying gas for the purpose of illumination.—21st September.

— Francis Coffin, of Russell-square, London, in consequence of a communication made to him by a foreigner residing abroad, for certain improvements in the construction of printing machinery or presses.—24th September.

To Matthew Hawthornthwaite, of Kendal, weaver, for a new mode of producing certain patterns in certain woven goods.—4th October.

— John Isaac Hawkins, of the Chase Cottage, Hampstead-road, London, civil engineer, communicated to him by a foreigner residing abroad, for an improvement in the blowing pipe of blast furnaces and forges.—4th October.

— George Richard Elkington, of Birmingham, gilt toy maker, for an improved method for gilding copper, brass, and other metals, or alloys of metals.—4th October.

— William Hinkes Cox, of Bedminster, near Bristol, tanner, for an improvement or improvements in tanning.—14th October.

— John Pickersgill, of Coleman-street, London, merchant, in consequence of a communication made to him by a foreigner residing abroad, for improvements in preparing and in applying India rubber (caoutchouc) to fabrics.—14th October.

— Thomas John Fuller, of the Commercial-road, Limehouse, civil engineer, for a new or improved screen for intercepting or stopping the radial heat arising or proceeding from the boilers or cylinders of steam-engines.—18th October.

— George, Marquis of Tweeddale, for an improved method of making tiles for draining soils, house tiles, and flat and roofing tiles and bricks, the word "bricks" having been omitted in former patent of 25th May last.—19th October.

— William Hale, of Croom's-hill, Greenwich, civil engineer, for certain improvements in machinery applicable to vessels propelled by steam and other power, which improvements, or parts thereof, are applicable to other useful purposes.—22nd October.

List of Patents

Granted by the French Government from the 1st of October to the 31st of December, 1835.

PATENTS FOR FIFTEEN YEARS.

To Charler Toplis, of London, represented in Paris by Mr. A. Perpigna, advocate, of the French and Foreign Office for Patents, 4, Rue Choiseul, for improvements in steam-boilers and furnaces.

— Hector Ledru, of Marseille, represented by Mr. A. Perpigna, advocate, for an hydraulic machine.

— Pierre Bourée, of Boulogne-sur-Mer, represented in Paris by Mr. Perpigna, advocate, for an improved method of reviving animal charcoal.

— Charler Vallery, of Lille, represented in Paris by Mr. Perpigna, advocate, for an apparatus for preserving corn.

— Dupuy de Grandpré, of Bordeaux, for a machine for towing boats, and called by him *hydraucélère.*

— Houzeau Muiron, of Rheims, for a new method of manufacturing glass.

— Henri Louis Sarrazin, of Bordeaux, for a new kind of cloth without any previous spinning and weaving, and applicable to the doubling of strips, and other purposes.

— Charles Edme Roblot, of Paris, for a mechanical brush for polishing the papers used for the hangings of rooms.

— Nathaniel Réal Solly, of London, for a new process of refining cast-iron, and improving the quality of wrought-iron.

— Denis Claude Edouard Tarbé, of Paris, for a new process of casting printers' types.

— Coulon and Carpentier, of Paris, for an hydraulic machine.

— Aimé Nicolas Derode, of Paris, for an improved method of lighting with gas.

— James Hudson, of Wales, for an economical method of printing silk or other fabric.

— Noel Rollet and Sabouraud, of Rochefort, for an improved method of preserving meat.

To Des Maurel and Guillon, of Lyons, for a frame calculated to weave at the same time several pieces of velvet.

— Saunders, of London, for a method of clarifying and discolouring, without heat, the cane, beet-root, and other saccharine juices.

— Pierre Joseph Taquet, for improvements in the manufacturing of indigenous sugar.

— Henri Hind Edwards, engineer, of Paris, for a refrigerator.

— Pool, of London, for improvements in the machines employed for making nails.

PATENTS FOR TEN YEARS.

— James Carpenter, of Pottsville, Pennsylvania, represented in Paris by Mr. Perpigna, advocate, of the French and Foreign Office for Patents, 4, Rue Choiseul, for a new system of trusses, and a new method of applying the same.

— Charler Mahiet, of Chinon, represented by Mr. Perpigna, advocate, for a new motive power to be used in place of steam-engines.

— Louis Bourret, of Paris, for a new method of enveloping cakes of purified soap.

— Auguste Capdeville, of Gentilly, for a method of reviving animal charcoal

— Hallette and Turner, of Arras, for an improved steam boiler.

— Thomas Bevillon, of Macon, for a cylindrical press for extracting every kind of liquid.

— Lesperment, of Fontany, near Salins, for a machine for manufacturing paper.

— Mathias and Pochard, of Paris, for an improved register with moveable coverings.

— Antoine Maillieux, of Rocroy, for a method of washing ore by means of a cylinder.

— Ange Marie Stanislas Boulard, of Orleans, for a means of converting yellow and red ochre into green ochre.

— Felix Albinolo, of Paris, for an improved method of preparing skins for bookbinding.

To Jean Boivin, of St. Etienne, for a mechanical motion applicable to the brocading batten with several shuttles.

PATENTS FOR FIVE YEARS.

— Joseph Raymond Desaybats, of Nerac, represented in Paris by Mr. Perpigna, advocate, of the French and Foreign Office for Patents, 4, Rue Choiseul, for a mechanical apparatus for containing restive horses or horned cattle when they are to be shod, or to undergo any surgical operation.

— André Blondeau Pharmasien, of Paris, for an alkaline sugar.

— Jean Guiraud, of Nimes, for improvements on the Jacquard frame.

— Louis Crevecieur, of Calais, for a wheel applicable to all kinds of bobbin-net frames.

— Florimond Tripier, of Lille, for an economical method of oiling wool.

— Bonnant, junior, of Nantes, for an instrument to be used in whale fishery, and called by him harpoon-gun.

— George Felix Poinsot, of Paris, for a method of platting hats with palm leaves.

— Louis Napoleon Loire, of Paris, for a mechanical pen with a caoutchouc ink reservoir.

— Edouard Nicolas Daubrée, of Lavaur, for a new process of manufacturing and reviving animal charcoal

— Selligue, of Paris, for a new kind of fire-arm.

— Nicolas Huet, of Paris, for an economical method of oiling wool.

— Henri Rochfort, of Calais, for an *arcanographic* machine.

— Robert Paul Coignet, of Vincennes, for a machine for carrying vertically earth and building materials.

— Caïman-Duvergier, of Paris, for an hydraulic machine, called by him *hydrobole.*

— Cherubin and Christen, of Paris, for an improved method of printing ornamented paper for the hanging of rooms.

— Claude Junot, of Paris, for a key for turning the nuts of screws.

— Pierre Uberti, of Paris, for a chemical compound, to be used as a preservative against epidemic diseases.

To Emile Bouchotte and Co., of Metz, for a machine for manufacturing pin-nails.

— Debac, of London, for a new method of setting swords, poniards, knives, and other arms or utensils of the kind.

— Claudot Dumont, of Fontainbleau, for a method of manufacturing gas for illumination.

— Levesque, Brothers, of Lillebourne, for power looms.

— Boillé, of Paris, for improvements in the Jacquard frame.

— Jean Julien Berthon, of Paris, for the application of portable bathing tubs to warm and cold water reservoirs.

— Jean Baptiste Rivet, of Paris, for an alimentary substance, called by him *indostane.*

— Joseph Marie Giudicelli, of Paris, for a hydrostatic alarum clock.

— Jean Baptiste Aune, of Paris, for a means of manufacturing cushions of billiard tables with caoutchouc.

— Jean Rebouil, of Paris, for an improved lock.

— Raimond Subsol, of Tosse, for a method of extracting pure turpentine from the maritime pine tree.

— Lefèbre Fievet, of Turwing, for an economical stove.

ADDITIONAL SPECIFICATIONS INROLLED BY THE FOLLOWING PATENTEES FOR IMPROVEMENTS.

— Bouvier, of Orange, represented in Paris by Mr. Perpigna, advocate, of the French and Foreign Office for Patents, 4, Rue Choiseul, on his smoke-preserving apparatus.

— Jean Marie Bompar, of Bourdeaux, represented in Paris by Mr. Perpigna, on his rast supported by two cones.

— Le Mare and Jamesel, of Paris, on their ovens with a circulation of hot air.

— Jean Lagarde, of Damazan, on his hydraulic machine.

— Charles Jean Waix, of Strasbourg, on his plough.

— Alexandre Francoise Selligue, of Paris, on his new gas-light.

— Champillier and Pearson, of Calais, on their frame for manufacturing spotted bobbin-net.

— Champaillier and Pearson, of Calais, second improvement on their bobbin-net frame.

— Denis Rodier, of Ganges, on his machine for winding silk.

To Pierre Alexis Bobœuf, of Paris, on his process of raising in relief every kind of sunk engraving.

— Perrot, of Rouen, on his machine for printing tissues and paper.

— Felix Lamer, on his machine for making pin-nails.

— Menotti-Braff, and Co., of Paris, on their process for rendering every kind of tissue impermeable to water, while it remains permeable to elastic fluids.

— Dubrulle Arondel, on his lamp.

— Marion de la Brillantais, on his system of mills for grinding corn.

— Francois, Brothers, of Nantes, on their *harpoon-gun.*

— Jean Viel, of Incheville, on his vertical spindle for the self-acting mule.

— Philibert Darnison, of Lyons, on his process for cleansing, doubling, and shearing silk, and other fibrous substances.

— Louis Michel Bazin, of St. Servan, on his process of substituting leather to iron or brass commonly used in certain parts of pulleys.

— Alexandre Joachim Fontaine, of Paris, on his bread-making machine.

— Joseph Maitre, of Paris, on his flour-mill.

— Charles Louis Derosne, of Paris, on his process for reviving animal charcoal.

— Cellier Blumenthal, of Paris, on his apparatus for boiling beet-root juice in vacuo.

— Benigne Joanne, of Paris, on his lamp called by him *astéare.*

— Levrat, junior, of Vienne, on his spinning frame.

— Mathieu, of Paris, on apparatus for making gas.

— Terrasson de Tongères, on his method of manufacturing bricks.

— Houzeau-Muison, of Paris, on his system of portable gas.

— Rathier and Guibal, of Paris, on their process of cutting caoutchouc into threads, and forming with it elastic tissues.

— Galy Cazalat, of Paris, *ninth improvement* on his steam-coach.

— Henri Sanford, of Paris, on his machine for making paper.

— Rubaud, Brothers, and Co., of Marseilles, on their machine for raising ships above water.

New Patents

SEALED IN ENGLAND,

October, 1836.

To Moses Poole, of Lincoln's Inn, in the county of Middlesex, gentleman, for improvements in anchors and friction rollers, to facilitate the lowering and raising such and other anchors, which friction rollers are applicable to other purposes, being a communication from a foreigner residing abroad.—Sealed 15th September—6 months for inrolment.

To William Pringle Green, of Falmouth, in the county of Cornwall, Lieutenant in the Royal Navy, for his invention of improvements on capstans, applicable to ships and other purposes, and for methods or contrivances to reduce manual labour at capstans used at mines; such methods or contrivances strengthening capstans, prevents them being overpowered, and are improvements on the modes hitherto resorted to for the performance of work, such capstans, methods, and contrivances, being used conjointly or separately, and for raising ore and men from mines.—Sealed 28th September—six months for inrolment.

To John Isaac Hawkins, of Chase Cottage, Hampstead-road, in the county of Middlesex, civil engineer, for an improvement in the blowing pipe of blast furnaces and forges, being a communication from foreigner residing abroad.—Sealed 28th September—6 months for inrolment.

To George Crane, of Yuiscedywyn Iron Works, near Swansea, iron-master, for his invention of an improvement in the manufacture of iron.—Sealed 28th September—6 months for inrolment.

To William Neale Clay, of West Bromwich, in the county of Stafford, manufacturing chemist, for his invention of improvements in the manufacture of sulphate of soda.—Sealed 28th September—6 months for inrolment.

To Richard Pearson, of Saint Giles's, Oxford, organist, of Carfax Church, Oxford, for his invention of certain improvements in drags or apparatus for retarding carriages.—Sealed 28th September—6 months for inrolment.

To John Ledyard Phillips, of Melksham, in the county of Wilts, cloth manufacturer, for his invention of an improvement in the manufacture of woollen cloths.—Sealed 4th October—2 months for inrolment.

To James White, of Lambeth, in the county of Surrey, engineer, for his invention of certain improvements on railways.—Sealed 4th October—6 months for inrolment.

To Charles William Stone, of Finchley, in the county of Middlesex, mechanic, for an invention of improvements in harness for weaving purposes, and in the apparatus for making the same, being a communication from a foreigner residing abroad.—Sealed 4th October—6 months for inrolment.

To Henry Huntley Mohun, of Walworth, in the county of Surrey, doctor in medicine, for his invention of improvements in the manufacturing of fuel.—Sealed 4th October—6 months for inrolment.

To Samuel Tonkin Jones, of Manchester, in the county palatine of Lancaster, merchant, for his invention of certain improvements in the tanning of hides and skins.—Sealed 6th October—6 months for inrolment.

To Miles Berry, of the Office for Patents, Chancery-lane, in the parish of St. Andrew, Holborn, in the county of Middlesex, mechanical draftsman, for certain improvements in machinery or apparatus for making or manufacturing metal screws.—Sealed 6th October—6 months for inrolment.

To John Sharp, of the borough of Dundee, in the county Forfar, in North Britain, flax-spinner, for his invention of certain machinery for converting ropes into tow, and certain improvements in certain machinery for preparing hemp or flax for spinning, part of which improvements are also applicable to the preparing of cotton, wool, and silk for spinning.—Sealed 6th October—6 months for inrolment.

To Henry Scott, junior, and Robert Stephen Oliver, hatters, both of the city of Edinburgh, a certain improvement or improvements in the manufacture of hats, caps, and bonnets, being a communication from a foreigner residing abroad.—Sealed 13th October—6 months for inrolment.

To Frederick Benjamin Geithner, of Birmingham, in the county of Warwick, brass-founder, for his invention of improvements applicable to the drawing or winding up of window and other roller blinds or maps, which improvements are applicable to other useful purposes.—Sealed 13th October—6 months for inrolment.

To John Hemming, of Edward-street, Portman-square, in the county of Middlesex, gentleman, for his invention of improvements in the manufacture of white lead.—Sealed 13th October—6 months for inrolment.

To Thomas Lutwyche, of Liverpool, in the county palatine of Lancaster, manufacturing chemist, for his invention of certain improvements in the construction of apparatus used in the decomposition of common salt, or in the mode or method of working or using the same.—Sealed 13th October—6 months for inrolment.

To John Ruthven, of Edinburgh, for his invention of improvements in the formation of rails or rods for making railways, and in the method of fixing or joining them.—Sealed 13th October—6 months for inrolment.

To Charles Pierre Devaux, of Fenchurch-street, in the city of London, merchant, for a new or improved apparatus for preventing the explosion of boilers or generators of steam, being a communication from a foreigner residing abroad.—Sealed 13th October—6 months for inrolment.

To John Joseph Charles Sheridan, of Peckham, in the county of Surrey, chemist, for his invention of certain improvements in the several processes of saccharine, vinous, and acetous fermentation.—Sealed 20th October—6 months for inrolment.

To William Bridges Adams, of Brecknock-crescent, Camden-town, in the county of Middlesex. coach-maker, for his invention of certain improvements in wheel carriages.—Sealed 20th October—6 months for inrolment.

To Christopher Nickels, of Guildford-street, Lambeth, in the county of Surrey, manufacturer of caoutchouc, for improvements in preparing and manufacturing caoutchouc, applicable to various useful purposes, being partly a communication from a foreigner residing abroad.—Sealed 24th October—6 months for inrolment.

CELESTIAL PHENOMENA, FOR NOVEMBER, 1836.

D.	H.	M.	
1			Clock after the ☉ 10m. 17s.
	—		☽ rises 10h. 25m. A.
	—		☽ passes mer. 5h. 52m. M.
	—		☽ sets 2h. 15m. A.
	2	39	☽ in □ or last quarter.
	5	38	♂ in conj. with the ☽ diff. of dec. 3. 49. S.
	14	11	♃ in conj. with the ☽ diff. of dec. 4. 54. S.
2	18	11	♃'s second sat. will im.
			Occul. 42 Leonis, im. 17h. 30m., em. 18h. 34m.
5			Clock after the ☉ 16m. 14s.
	—		☽ rises 2h. 10m. M.
	—		☽ passes mer. 8h. 53m. M.
	—		☽ sets 3h. 19m. A.
	15	6	♂ □ ☉
6	7	54	☿ greatest elong. 18. 54. W.
	15	49	♃'s first sat. will im.
7	3	47	☿ in conj. with the ☽ diff. of dec. 1. 2. N.
8	1	46	♄ in conj. with the ☽ diff. of dec. 2. 10. N.
	9	2	☿ greatest Hel. Lat. N.
	—		☉ eclipsed, invisible at Greenwich.
	23	4	♃ in □ ☉
9	1	34	Ecliptic conj. or ● new moon.
	14	24	♅ stationary.
10			Clock after the ☉ 15m. 52s.
	—		☽ rises 9h. 12m. M.
	—		☽ passes mer. 1h. 5m. A.
	—		☽ sets 4h. 50m. A.
11			Occul. 3 Sagitt. im. 4h. 47m., em. 5h. 27m.
	23		☽ in Perigee.
13	11		♂ in conj. with ♃ diff. of dec. 1. 22. N.
	17	43	♃'s first sat. will im.
15			Clock after the ☉ 15m. 9s.
	—		☽ rises 1h. 51m. A.
	—		☽ passes mer. 6h. 12m. A.
	—		☽ sets 10h. 44m. A.
	5	51	☽ in □ or first quarter.
	12	11	♃'s first sat. will im.
	15	26	♅ in conj. with the ☽ diff. of dec. 4h. 33m. N.
16			Mercury R. A. 14h. 26m. dec. 12. 35. S.
	—		Venus R. A. 12h. 47m. dec. 3. 5. S.
16			Mars R. A. 9h. 24m. dec. 17. 21. N.
	—		Vesta R. A. 16h. 22m. dec. 19. 2. S.
	—		Juno R. A. 12h. 50m. dec. 3. 32. N.
	—		Pallas R. A. 20h. 58m. dec. 3. 51. S.
	—		Ceres R. A. 23h. 3m. dec. 19. 23. S.
	—		Jupiter R. A. 9h. 21m. dec. 16. 10. N.
	—		Saturn R. A. 14h. 43m. dec. 12. 45. S.
	—		Georg. R. A. 22h. 12m. dec. 11. 58. S.
	—		☿ passes mer. 22h. 45m.
	—		♀ passes mer. 21h. 3m.
	—		♂ passes mer. 17h. 40m.
	—		♃ passes mer. 17h. 36m.
	—		Occul. τ^2 Aquarii, im. 3h. 27m., em. 4h. 36m.
17	9	1	☿ in conj. with ♄ diff. of dec. 0. 34. S.
18	12	14	♃'s third sat. will im.
	16	45	♃'s third sat. will em.
	21		♀ in Perihelion.
20			Clock after the ☉ 14m. 5s.
	—		☽ rises 3h. 1m. A.
	—		☽ passes mer. 10h. 1m. A.
	—		☽ sets 4h. 4m. M.
	12	38	♃'s second sat. will im.
21			Occul. 53 Arietes, im. 15h. 27m., em. 16h. 22m.
22	9	41	♅ □ ☉
	14	4	♃'s first sat. will im.
23	5	31	Ecliptic oppo. or ○ full moon.
25			Clock after the ☉ 12m. 42s.
	—		☽ rises 5h 6m. A.
	—		☽ passes mer. 1h 13m. M.
	—		☽ sets 10h. 10m. M.
	12	9	♃'s third sat. will em.
26	22		☽ in Apogee.
27	15	13	♃'s second sat. will im.
29	1	11	♃ in conj. with the ☽ diff. of dec. 4. 44. S.
	1	15	♂ in conj. with the ☽ diff of dec. 2. 51. S.
	15	57	♃'s first sat. will im.

J. LEWTHWAITE, Rotherhithe.

METEOROLOGICAL JOURNAL,

FOR SEPTEMBER AND OCTOBER, 1836.

1836.	Thermo		Barometer.		Rain in inches.	1836.	Thermo.		Barometer.		Rain in inches.
	Hig	Low.	High.	Low.			Hig.	Low	High.	Low	
Sept.						Oct.					
26	67	56	30,06	29,90		11	57	51	29,34	29,12	.525
27	65	55	29,76	29,75		12	57	42	29,51	29,32	
28	58	49	29,65	29 53	,05	13	60	48	29,35	29,05	,075
29	60	49	29,28	29.26	,55	14	58	50	29,87	29.62	.025
30	52	42	29,50	29,32	,4	15	61	48	29 86	29.77	,0125
Oct.						16	59	40	30.13	30,11	,1125
1	53	36	29 38	29,04	12	17	63	48	30.10	30.09	
2	52	39	29,29	29,15	,375	18	63	52	30,07	30.05	
3	50	41	29,35	28,86	,375	19	59	5.	30,29	30.09	.125
4	53	30	29,51	29.41		20	56	32	30,34	30,28	
5	55	32	29,88	29,72		21	54	36	30,25	30,21	
6	57	36	29,82	29,58	,025	22	55	41	30,30	30,29	
7	60	51	29.45	29,37	,9	23	57	32	30,29	30.28	
8	58	52	29,35	29,33	,275	24	54	41	30,29	30.25	
9	55	43	29.36	29,31	,125	25	52	46	30,18	30,13	
10	58	46	29,33	29,26	,1						

Edmonton. CHARLES HENRY ADAMS.

Latitude 51° 37 32 N.
Longitude 3 51 West of Greenwich.

THE

London
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CONJOINED SERIES.

No. LVII.

Recent Patents.

To Thomas Robert Sewell, *of Carrington, in the parish of Basford, in the county of Nottingham, lace-manufacturer, for his invention of certain improvements in machinery for making lace, commonly called bobbin-net.*—[Sealed 2nd December, 1835.]

These improvements in machinery for making lace, commonly called bobbin-net, apply to that particular class of machinery known under the description "double-tier circular bolt, or circular comb machinery, worked on the locker-bar principle." The first object proposed to be effected by these improvements, is the making of breadths, that is, the production of several narrow widths of net in one broad sheet, the selvages of which are connected together by whipping threads; the second object is the working of figures or ornamental devices in the fabric, in conjunction with the production of the net.

In the words of the Patentee, "These improvements are principally adapted to that peculiar construction of circular bolt, or circular comb machinery, usually denominated Sewell's-rolling locker principle; and for their better illustration, I have, in the accompanying drawings, in the first place, exhibited the arrangement of the operative parts of a machine on that construction, and will proceed to describe the details.

Fig. 1, Plate VII., is a front elevation one half of the machine, in the form and according to the arrangement in which I originally constructed it for the making of plain bobbin net. Fig. 2, is a section taken vertically through the middle of the machine, looking towards the other end.

The machinery is mounted in two end frames, or standards A, A, braced together by the longitudinal bars and frames, B, B, B. The warp beam is shown at C, and the work beam at D. The front and back comb bars are marked E, E, the guide bars F, F, the point bars G, G, the work bar H, and the locker bars I, I. The rigger, or pulley K, driven by a strap from any first mover, is fixed on the outer end of a longitudinal shaft L, extending about half way along in front of the machine; which shaft also carries a toothed wheel M, taking into another wheel N, on the main longitudinal shaft O, O, by which the cams and levers are actuated that work the operative parts of the machinery. Bobbins and carriages *a*, *a*, having been inserted in two tiers in the combs *b*, *b*, as shown in fig. 2, and the warp threads conducted through the guides *c*, *c*, and with the bobbin threads carried up to the work beam D, in the ordinary way, the machine may be considered ready for performing its work. Rotary motion being now given, in the manner above described, to the main shaft O, O, the excentric groove or heart cam P, on the face or disc of the wheel N, as it revolves, will act upon a stud or anti-friction roller on the side of an arm Q, extending from the middle of the longitudinal shaft R, R, to the ends of which shaft the segment racks S, S, are attached. These segment racks S, S, take into toothed pinions T, T, fixed to the ends of the locker bars I, I; and hence, as the excentric groove or heart cam P, revolves, the arm Q, the shaft R, and the segment racks S, S, will be made to vibrate, and to give such reciprocating rolling movements to the locker bars I, I, as are requisite for working the bobbin carriages *a*, *a*, to and fro in the combs *b*, *b*. These locker bars are furnished with peculiarly-formed blades, as shown in transverse section at fig. 2; the blades being bent or formed in certain curves, and severally standing at different distances apart, for the purpose of acting against the tails of the carriages, as the locker bars roll in such a manner as to cause the carriages to move with irregular speeds in the different parts of the operation, the particular object of which is, that the bobbin carriages *a*, *a*, may be placed at a sufficient distance apart when in the middle of the machine, to allow of the lateral or shogging movements of the warp threads; and that when the carriages are passed into either the back or the front combs, they may be brought nearly close together, and the extent of their action limited.

The shogging or lateral movements of the guide bars F, F, and of the front comb bar E, are effected, the former by crank levers, rods, and arms *d*, *d*, *d*, acted upon by cam wheels *e*, *e*, at the ends of the machine; the latter by other crank levers, rods and arms *f*, *f*, *f*, acted upon by cam wheels *g*, *g*, all fixed on small shafts *h*, *h*, mounted in bearings at the outer parts of the end standards, as shown in fig. 1. The point bars G, G, are worked for the purpose of taking up the twist by jointed levers *i*, *i*, *i*; at the lower extremities of which, there are anti-friction rollers acting upon the peripheries of the cams *k*, *k*, likewise fixed upon the shafts *h*, *h*; but all these shogging movements may be described as similar to those of ordinary locker machines. The small cam-wheel shafts *h*, *h*, are made to revolve by means of pinions *l*, *l*, at the ends of the main shaft o; which pinions take into wheels *m*, *m*, fixed on the cam shafts *h*, *h*; and hence, by the rotation of the main shaft, the cam wheels are driven when the other parts of the machine are in operation.

Thus far I have described the general construction of that kind of machine for making bobbin-net lace, called "Sewell's rolling-locker machine," upon which the principal parts of my present improvements are founded. I now proceed to point out those improvements, their particular objects, and mode of operating: in the first place, for the production of several narrow breadths of net in one sheet, having distinct selvages connected together by whipping threads; and secondly, for figuring.

The mode which I originally adopted for fixing the brass blades to the iron locker bars, was by cutting longitudinal grooves in the bars; and after introducing the back edges of the brass blades into those grooves to beat the edges of the grooves inward, and thereby cause the iron to indent into the brass of which the blades were made, and hold them securely. In my present improvements, it is necessary to form openings or spaces in the blades of the back locker bar, for the purpose of allowing certain of the carriages to be held back, that is, kept stationary at certain periods of the operation, whilst the other carriages are working, in order that those carriages so held back may have the direction of their traverse changed, by being made to operate as turnagain and whipping carriages, which is well understood. For this purpose I construct the back locker bar as a cylindrical shaft, and cast all the blades together as wings in connexion with a cylindrical socket, in short portions, which I slip on to the bar endwise one after another, until the bar is filled from end to end, introducing between each two of the socketed pieces a very short or thin portion, or transverse section of such socketed pieces, formed as a ring, with fingers corresponding to the transverse sectional positions of the blades. I then, by pins or screws, or any other means, make fast to the shaft in longitudinal coincidence, the portions of the socketed blades of the locker bar, intended to work the plain parts of the net, allowing the loose portions of the blades to turn freely round the cylindrical shaft, when required to act, independently of the other parts of the blades.

For the better illustration of this, fig. 3, represents a portion of a cylindrical locker bar I, with the blades so constructed of socketed portions as described, and shown partly in longitudinal section. Fig. 4, is a transverse section of the same: *a, a,* are the moveable portions of the blades, which, for making breadths with selvages in the net, should each be equal in thickness to one gate of the circular combs; *b, b,* are the fixed portions of the blades. The ring of each moveable portions *a,* has a stem *c,* extending from its under part; which stems are all to be inserted into a longitudinal bar *d, d, d,* placed along, and parallel to, the whole length of the locker bar. The stems are all made fast to the longitudinal bar *d,* by screw nuts; and consequently the moveable dortions of the locker blades *a, a, a,* must all operate simultaneously. A long plate spring *e,* is attached near each end to the under part of the bar *d,* having a tooth *f,* at its acting extremity, which, by the force of the spring, is made to take into a notch *x,* in a collar or boss *g,* formed on one of the fast socketed pieces *b,* of the locker blades, near each end of the locker bar. By means of these teeth *f*, taking into the notches of the collars *g*, the fast and the moveable portions of the locker blades are held in coincidence, as shown in fig. 4; and they, consequently, under these circumstances, all act together. The fast and the moveable portions of the blades of the back locker bar so united, and their relative positions with the bobbins and carriages immediately before commencing the operation which effects the turnagain of the selvage carriages, are shown in the transverse section of the locker bars I, I, and comb bars E, E, at fig. 5.

In order to effect the operation upon the carriages at the selvages of the breadths called "turnagain," I employ a tappet wheel W, mounted near the middle of the machine, upon an elongation of the horizontal shaft *h*, which carries the Dawson's wheels that work the guide bars, point bars, and front comb bar at the right hand end of the machine. This tappet wheel W, is shown detached at fig. 6; its periphery may be supposed to be divided into twelve equal parts, corresponding to similar divisions on the Dawson's wheels, fixed upon the same shaft; and the elevations on the tappet wheel are so situated, as to act upon the neb at the lower end of the compound lever, which governs the moveable portions of the locker blades *a*, *a*, *a*, in accordance with the action of the other parts of the machinery; one rotation of the wheels effecting the production of a row of complete holes or meshes of the net.

The front comb bar being now in the act of shogging to the left hand, the elevation at the division (11) of the tappet wheel W, is brought into operation against the end of a compound lever, for the purpose of holding the bar *d*, with the moveable portions of the locker blades *a*, *a*, *a*, stationary. The manner of doing this will be understood by reference to the sectional representation of the locker bars I, I, and comb bars E, E, shown in fig. 7. The compound lever before mentioned, is represented in this and the following figures at *i*, *i*, *i*, the fulcrum pivots on which it acts being in the ends of the bar *k*, extending along the back of the machine, and on a stud *l*, fixed in a bar, standing transversely across near the middle of the machine. The elevation at the division (11) on the periphery of the tappet wheel w, having raised the neb *j*, at the lower end of the compound lever *i*, as in the last-mentioned figure, the pins *m*, in the small arms *n*, affixed to the bar *k*, at the upper end of the compound lever, are raised and made to take into the holes in the arms *o*, extending from the plates *e*, attached to the longitudinal bar *d*, before described. By these means, the bar *d*, with all the moveable portions of the locker blades *a*, *a*, *a*, are held fast, and the fixed portions of the blades *b*, *b*, *b*, moving on the spring teeth *f*, which held the fast and moveable portions of the locker blades in coincidence, slip out of the notches *z*, in the collars *g*, before described; and the moveable blades being thus held, and prevented from revolving, the fixed blades proceed alone. This holding back of the moveable portions of the locker blades *a*, *a*, *a*, causes the whipping carriages to be kept at the back part of the back combs, and the turnagain carriages to be prevented from passing on with the front tier; the turnagain carriages being by these means made to arrange themselves with the back tier. By the time that the fixed locker blades have advanced to those positions shown in fig. 7, the elevation (11) of the tappet wheel w, will be about to pass from under the neb *j*, of the compound lever; and at the instant that this takes place, the teeth *f*, of the plate springs *e*, will have passed into other notches *y*, in the collars *g*, and the front comb bar will have shogged to the right hand. When the neb or point *j*, at the lower end of the compound lever *i*, *i*, *i*, has fallen on to the smaller radius of the tappet wheel w, at the division (12), the position of the compound lever will be that shown at fig. 8, the pins *m*, having been withdrawn from the holes in the arms *o*; and the fast and moveable locker blades now rolling on together towards the front of the machine will assume the positions, and place the bobbin carriages as represented in the last-mentioned figure. The combined locker blades proceeding on still further in the same direction, the two tiers of ordinary carriages, with the turnagain carriages, will be conducted into the front combs, the whipping carriages still remaining in the back combs. The front comb bar, with the double tier of carriages, now shogs to the left hand.

By the returning vibratory movements toward the back of the machine of the locker blades, combined as last described, the carriages will be again brought into the situations shown in fig. 8; and proceeding onward, the whipping carriages will arrive at the back part of the back combs; and the moveable portions of the locker blades *a*, *a*, *a*, with the longitudinal bar *d*, and arm *o*, will re-assume the positions shown in fig. 7. The elevation at the division (2) on the periphery of the tappet wheel w, will now come under the neb *j*, at the lower end of the compound lever *i*, *i*, *i*, and consequently, raise the arms *n*, as before, when the pins *m*, will pass into the holes in the arms *o*, and will hold the moveable portions of the locker blades securely, while the front tier of carriages are passed into the back combs by the further movements of the locker bars.

When the tappet wheel w, has turned sufficiently far to allow the neb *f*, of the compound lever to fall on to the small radius of the wheel at the division (3), the pins *m*, will be again withdrawn from the holes in the arms *o*, the lockers and carriages at this moment standing in the positions represented before at fig. 5. The moveable and the fixed portions of the locker blades now act in conjunction, passing both the tiers of carriages from the back to the front combs, and in returning toward the back of the machine, when one tier of carriages has arrived in the back combs, the front comb bar is shogged to the right hand; after which, the movements of the carriages proceed as in the ordinary way of making plain net, until the tappet wheel w, has revolved sufficiently far to bring the elevation at the division (11) again into operation against the neb *j*, of the compound lever *i*, *i*, *i*, when the evolutions of the machine are again carried on, as before described.

The forms of the cams, technically called the Dawson's wheels, for shogging the ordinary guide bars and front comb bar suited to the machinery above described, are shown at fig. 9: A, A, A, represents the periphery of the wheel, which shogs the front comb bar; B, B, B, the wheel for shogging the back guide bar; and C, C, C, that for shogging the front guide bar. The peripheries of these wheels are divided radially into twelve equal parts, corresponding to the divisions of the tappet wheel, fig. 6, above described.

Thus far I have explained the construction of my improved machine for making narrow breadths of bobbin-net lace with selvages, connected together in one broad sheet; and in so doing, I have described such means of holding back the moveable portions of the locker blades, as I have found suitable and convenient for that purpose. I do not, however, mean to confine myself precisely to the method shown, as it must be obvious that other modes of occasionally catching, stopping, or taking hold of and confining the moveable portions of the locker blades might be adopted. I have described each of the moveable portions of the locker blade *a*, *a*, *a*, as equal in thickness to one gate of the combs, which is sufficient for making narrow breadths of net with selvages; but I do not intend to limit myself to any particular thickness of the moveable portions of the locker blades; as, under some circumstances, it will be desirable that the moveable portions should be made wide enough to cover several gates of the combs, in order to hold back several adjacent carriages for the production of ornaments at those parts of the net. I also sometimes associate together several of the moveable portions of the locker blades, with their metal washers fixed upon the locker bar, slightly pressing laterally between every two portions of the blades; and I act upon these several portions of the locker blades separately or collectively, as may be necessary, for producing ornaments in the net.

I have said that, in making breadths and whipping their selvages together, the tappet wheel w, must perform one entire revolution in coincidence with one revolution of the shogging wheels, or Dawson's wheels, at the end of the machine; but, by dividing the periphery of the tappet wheel w, into twenty-four parts, and placing the elevations, as before, in the spaces 2 and 11, and causing that wheel to revolve only once during two rotations of the Dawson's wheels, I should produce eyelet holes in the net instead of selvages whipped together; and it must be obvious that by varying the form of this tappet wheel with the apparatus above described, I can produce a variety of ranges of eyelet holes in the net, technically called bullet holes.

Another modification of the machinery is shown in transverse sectional elevation at fig. 10, in which several of the moveable portions of the locker blades may be supposed to be associated together in sets, and mounted loosely upon both the back and front locker bars, in conjunction with fixed portions of the socketed locker blades, as described above, with other apparatus, by means of which the moveable portions of the locker blades may be severally or collectively acted upon by catches or holders, for the purpose of holding back certain of the bobbin carriages at suitable periods of the evolutions of the machine, for the production of ornaments in different parts of the net.

The principal operative parts of this machine are shown in partial section at fig. 11: I, I, are the locker bars on which the moveable portions of the locker blades *a*, *a*, *a*, and a^*, a^*, a^*, are mounted, and also the fixed portions of the blades *b*, *b*, *b*: E, E, are the comb bars; F, F, the guide bars, supported by curved arms attached to the longitudinal framing bars B, B. These moveable portions of the locker blades have each three stems *c*, *c*, *c*, extending radially, as shown in the drawing; and a notch is formed at the outer extremity of each stem, for the reception of a catch or jack *d*, the upper point of the jack head being intended, by passing into the notch of the stem, to confine any one of the moveable portions of the locker blades in such positions as may be required. These catches or jacks *d*, are severally formed, as shown detached in two views at fig. 12; and they are collectively mounted on a pin *e*, between plates or combs *f*, cast in leads, as shown detached in two views at fig. 13. By means of these leads and combs, a series of these jacks are attached to the jack bars U, U, fixed longitudinally at the back and front of the machine under the comb bars. The lower points of the jack heads bear upon the indented peripheries of two cylinders, formed as organ or chime barrels X, X, or a series of tappet wheels closely confined and fixed upon two shafts, would answer the purpose. These barrels or wheels X, X, being made to revolve, will work the jacks *d*, occasionally raising certain of them so as to cause the upper points of the jack heads to take into the notches in the stems *c*, and thereby hold certain of the moveable portions of the locker blades at such periods of the evolutions of the machine, as may be necessary for producing patterns in the lace.

The means by which the wheels or barrels x, x, are made to revolve, is shown in the sectional elevation of the machine at fig. 10.

On an elongation of the shaft *h*, of the Dawson's wheels, just within the framework at one end of the machine, a tappet wheel v, is mounted, the inequalities on the periphery of which wheel as it revolves act against the neb *i*, of the levers *g*, *g*. These levers are mounted on studs in the end frame, and carry the upright clicks or clawkers *k*, *k*, the points of which respectively take into the teeth of ratchet wheels *l*, *l*, fixed at the end of each of the organ barrels x, x. Hence it will be perceived that by the rotation of the tappet wheel v, such reciprocating movements will be given to the levers *g*, *g*, as will cause the clicks or clawkers *k*, *k*, to drive the ratchet wheels *l*, *l*, with the organ barrels x, x, progressively round upon their axes, and thereby to raise the jacks at the periods required for holding the moveable locker blades, and keeping back certain of the bobbin carriages.

It will be obvious that, by varying the forms of the indentations on the peripheries of the barrels x, x, or of the tappet wheel v, or of both, a great variety of patterns may be produced in the net by thus holding back such of the bobbin carriages as I may think proper to keep from traversing, and that by such means I can produce ranges of large and small ornamental bullet holes or eyelet holes in the net, either lengthwise, crosswise, or diagonally, in lines, or zigzags, or other forms; and also by the same means prevent certain bobbin carriages from twisting their threads round the warp threads, in order to produce in the net certain kinds of work resembling what is technically called fining. And further, I occasionally hold back certain of the bobbin carriages by means of small hooked levers *m*, attached to a vibrating shaft *n*, at the back or front of the machine, as shown in the sectional fig. 11, which shaft may be acted upon to produce the vibratory movements of the hooked levers in various ways. For instance, if a suitable connexion by means of a rod were made between the shaft *n*, and the compound lever *i*, worked by the tappet wheel W, as described in reference to figs. 7, and 8, the hooked levers might be worked by that means.

These hooked levers may, instead of being attached to the vibrating bar *n*, be mounted in peculiarly formed combs *o*, attached to the bars E, E, as shown in the sectional fig. 14, and in that arrangement the tails of the levers extending outward, might be acted upon by a tappet barrel *p*, at the back and front of the machine, or by cam wheels driven by any convenient mechanism; such, for instance, as clawkers taking into ratchet wheels, in the same way as the tappet barrels which work the jacks in fig. 10.

In order to produce embroidered work in satin stitch, in the form of spots, leaves, stripes, zigzags, and a variety of other ornamental devices upon the surface of the net made in the above described machinery, or other construction of circular bolt or circular comb machinery, I hold back one or more of the bobbin carriages by the above described means, or by any other convenient means; and I pass embroidering threads from auxiliary bobbins round one, two, or more of the ordinary bobbin threads at one time, by means of apparatus shown in fig. 14.

This apparatus consists of a hollow tube *q*, having a pinion *r*, at its lower end, and an opening is made through the whole extent of the side of this tube and pinion, as shown in the detached fig. 15. As many of these tubes as may be required, I propose to mount upon a longitudinal bar *s*, attached to arms *t*, hanging on studs coincident with the centres at the ends of the machine. A small bracket *u*, which carries a hollow cylindrical stud *v*, shown in two positions at fig. 16, is affixed to the bar *s*, for the support of each tube. Upon this stud *v*, the tube *q*, is mounted; and a rack bar *w*, in connexion with the pinion *r*, by moving longitudinally causes the tube *q*, to turn upon the stud *v*. An arm *x*, attached to the tube *q*, carries a small pin cop or one-ended bobbin *y*, from which the thread is to be drawn for embroidering the net.

The bar *s*, carrying a series of these embroidering tubes, ranged side by side, at any required distances apart, is made to rise and fall by its pendant arms being connected through the agency of rods or levers with a tappet wheel below, or it may be moved by any other convenient mechanism. By these means the embroidering tubes are at certain periods made to descend into the position shown in fig. 14; and in so doing, one, two, or more, as may be required, of the threads of the bobbins which are held back, will together pass through the opening on the side of each of the tubes to the interior. While these bobbin threads are thus enclosed within the tubes *q*, a longitudinal movement of the rack bar *w*, will cause the pinion *r*, and tubes *q*, to revolve, and in so doing to carry the pin-cops *y*, with their embroidering thread, round the enclosed bobbin threads. When this has been done, the bar *s*, with the tubes *q*, is to be raised into the position shown by dots, the enclosed bobbin threads passing out through the opening in the side of each tube; and the bobbin carriages which were held back being now released, they fall in and work with the other ranges of bobbin carriages, causing the embroidering threads thus wound round certain of the bobbin threads to form as satin stitches upon the surface of the meshes as the net is produced.

The longitudinal movements of the rack bar *w*, which gives rotary motion to the pinions *r*, and tubes *q*, may be effected by a crank lever and rod worked by a large tappet wheel, in connexion with the Dawson's wheels' shaft at the end of the machine, or by any other suitable means; observing that each of these movements of the rack bar must be such as will give one, two, or more exact rotations to the tubes *q*, in order that the openings of the tubes when stationary may all stand exactly opposite to the courses of the carriages moving in the combs; and for the better effecting of this, I would recommend that the pitch of the teeth of the rack bar *w*, should correspond with the gauge of the combs.

The shogging or lateral movements of the bar *s*, may be effected likewise by a crank lever and rod, acted upon by a large tappet wheel in connexion with the shaft of the Dawson's wheels; the object of such shogging or lateral movement being for the purpose of bringing the openings of the tubes *q*, into situations capable of taking different bobbin threads at different times, and so distributing the satin stitches into the required patterns or devices upon the surface of the net.

I further propose to make figuring in bobbin net lace on circular bolt and circular comb machinery, by a peculiar adaptation of what are technically called "stumps," commonly employed for giving lateral movements to certain of the warp threads, independently of the other warp threads; and also by a peculiar adaptation of apparatus for causing an extra warp beam or beams to supply variable quantities of thread for the production of figures in the net.

For the better illustration of this part of my invention, I have shown these improvements, in connexion with an ordinary circular-bolt double-locker machine, in fig. 17, which represents a partial elevation of the back part of such a machine, principally exhibiting the positions of the improved parts; and fig. 18, is a transverse section of the same, as seen looking toward the left hand end of fig. 17. A, A, are the end standards; B, B, B, the framing on which the operative parts of the machine are supported; C, is the warp roller; D, the work roller; the longitudinal bars E, E, support the series of circular bolts *b*, *b*, on which the bobbin carriages *a*, *a*, move to and fro; F, F, are the guide bars carrying the guides *c*, *c*, which conduct the warp threads; G, G, are the point bars; H, the work bar; and I, I, the locker bars, to which the locker blades *d*, *d*, are affixed.

The wheel N, on the main shaft O, receives its rotary motion from any first mover, and communicates motion through the cam P, to levers which work the ordinary swing jacks and driving bars in a way that is well understood, and therefore needs not to be further described.

The wheel N, takes into a similar wheel Q, on a longitudinal shaft R, R, near the bottom of the machine, at each end of which shaft there is a pinion L, L, (containing twelve teeth), working in the teeth of the wheels M, M, (each containing one hundred and forty-four teeth, or other similar proportions), on the shafts of the Dawson's wheels: hence by the rotation of the wheel N, the Dawson's wheels are driven for working the point bars, the guide bars, the front comb bar, and several other parts of the mechanism, as will be further described.

The form of stump which I propose to employ is shown detached in two positions at fig. 19. Any number of these stumps that may be required are to be fixed upon the edge of a straight bar mounted longitudinally in the machine, between the ordinary guide bars as shown at S, in fig. 18, the stumps *e*, standing erect. This bar S, is supported upon the ends of two levers or arms, T, T, which are screwed to a longitudinal shaft V, having journals which turn and also slide laterally in plummer blocks; or bearings on brackets affixed to the framework at the back of the machine; and to the same shaft V, are also affixed two other levers or arms U, U, bent downwards towards their extremities, and carrying anti-friction rollers, which run upon the peripheries of cam wheels W, W, on the Dawson's wheels' shaft, at each end of the machine.

The indentations on the peripheries of these wheels W, must be made according to the pattern intended to be worked upon the net; and by the rollers at the ends of the bent levers or arms U, U, falling and rising as these indented wheels revolve, the arms, T, with the bars, will be lowered so as to bring the stumps down below the guides, and free from the warp threads, or raised up above the guides among the warp threads, as shown at *e*, in fig. 18.

The stumps *e*, when raised up into the situations last described, are intended to act by lateral movements upon certain of the warp threads, for the purpose of pressing such threads sideways out of their ordinary positions. These lateral movements of the stumps are effected by shogging the longitudinal bar V, which carries with it the arms T, T, and stump bar S. This shogging or lateral movement of the bar V, is produced by suitable cams on the Dawson's wheels' shaft at each end of the machine.

The extra warp beams are shown at X, X, placed one on each side of the ordinary warp beam C; their axles turn in bearings at the upper ends of upright arms Y, Y, which are fixed on longitudinal shafts mounted in the lower part of the end frames; see fig. 17. The threads supplied from the extra warp beams X, X, are represented in fig. 18, as conducted through the guides *c*, *c*, as ordinary warp threads, and are there intended to work in with the other threads, to assist in forming the meshes of plain net; but, occasionally, these threads are to be diverted to the production of patterns or devices in the net.

The warp beam c, is driven for the purpose of giving off the ordinary warp threads by means of a tappet wheel *g*, on the Dawson's wheels' shaft at one end of the machine, the inequalities on the periphery of which wheel work against a neb on the horizontal arm of a right-angled lever *h*. The lower end of this lever *h*, acts against the back of an arm *i*, affixed to the vertical shaft *j*; and upon this arm *i*, a clawker *k*, is mounted, which takes into the teeth of a ratchet wheel *l*, on the worm shaft *m*. On the upper end of this shaft *m*, a worm *n*, is fixed, which takes into the worm wheel *o*, on the axle of the warp beam c: hence, by the rotation of the tappet wheel *g*, the clawkers are made to drive the shaft *m*, and to give that slow rotary motion to the warp beam required for delivering the supply of warp threads. An arm *p*, affixed to the before-mentioned vertical shaft *j*, carries a clawker *q*, which takes into a ratchet wheel *r*, on the worm shaft *s*. The upper end of this shaft *s*, carries the worm *t*, which, by acting in the toothed wheel *u*, on the axle of the work beam D, causes the work to be taken up upon the beam D, by the action of the same tappet wheel *g*, that caused the warp to be given off from the beam c.

The extra warp beams X, X, are made to revolve by the friction of their surfaces bearing against the periphery of the ordinary warp beam c; consequently, when so driven, the lengths of warp threads delivered from each of the three beams will be equal; and such is the case when the plain parts of the net are making; but when the spotting or figuring is to be produced upon the net, then that extra beam X, from whence the threads are drawn that are to be worked in for forming the figuring, must be released from contact with the ordinary warp beam, and allowed to move independently upon its axis.

A short longitudinal shaft z, turning in bearings in the framing toward the back part of the machine, seen best in fig. 17, carries a cam wheel *w*, the elevated part of which, as it revolves by coming against one of the nibs or inclined plains *x, x*, projecting from the inner sides of the arms Y, Y, pushes the arm back, and thereby withdraws the extra work beam X, at top, from contact with the surface of the ordinary warp roller e. The nibs *x*, *x*, for convenience, are attached to spring arms, and are brought up to their proper bearings by set screws *y, y*. The extra warp beam being thus withdrawn from the ordinary warp beam, it is now at liberty to give off any length of thread that may be required for working the pattern, their necessary tension being obtained by weighted cords passed round the beam.

The Patentee has here exhibited, as an example, the out of wheels requisite for the working of one particular pattern; but almost an endless variety being within the range of this machinery, we have not thought it necessary to describe them, as any competent workman will be able to adapt them from the foregoing description. The specification concludes as follows :—

" Lastly, as it will be perceived that I have set out my improvements in connexion with many parts of machinery for making lace, which were heretofore known and in use, I desire it to be understood, that my claim of invention, which constitutes the subject of the above in part recited Letters Patent, consists in the following particulars :—

" First, the peculiar construction of the locker blades with fixed and moveable portions, and the modes of operating upon them, as set forth above, for producing narrow breadths of net with selvages, in one broad sheet; and also for working patterns in the net. Second, the adaptation of extra bobbins for conducting embroidering threads round the ordinary bobbin threads. Third, the application of a bar carrying stumps, having vertical movements between the guides, for the purpose of being shifted in and out of operation. And, fourth, the method of working extra warp beams for supplying warp threads for spotting or figuring the net."—[*Inrolled in the Rolls Chapel Office, June,* 1835.]

Specification drawn by Messrs. Newton and Berry.

To JAMES CHAMPION, *of Salford, in the county palatine of Lancaster, machine maker, for his invention of certain improvements in machinery for spinning, twisting, and doubling cotton and other fibrous substances.*—[Sealed 6th January, 1836.]

THESE improvements in machinery for spinning, twisting, and doubling cotton and other fibrous substances, apply principally to that description of spinning machinery called throstles, and consist, firstly, in a mode of preventing the inconvenience of unequal drag upon the yarns in winding upon the bobbins, resulting from the usual inaccuracy and want of uniformity in the shapes of the bearings and dimensions of the bores of the several bobbins or spools successively mounted upon the spindles of a spinning machine whilst working; which is effected by rendering the friction and drag of the dissimilar bobbins uniform, through the intervention of a permanent carrier bobbin fitted loosely upon the spindle for the purpose of receiving the winding bobbins. By means of this permanent carrier the friction of the bobbin upon the spindle will be at all times uniform, although the several bobbins successively placed thereon may be some of them loose, some tight, and otherwise unequal in their figures. Secondly, in the adaptation of a loose collar of considerable weight acting as an extra bolster to support the spindle, and capable of revolving in its socket in the copping rail if pressed by any unequal friction of the spindle, caused by vibration, or from an inaccuracy in its perpendicularity. Thirdly, in the construction of a flyer with three, four, or more arms, for the purpose of varying and regulating the strain of the yarn between the flyer and the front drawing rollers. And, fourthly, in the employment of a small extra spindle carrying the bobbin or spool, and turning partly within a hollow spindle, in order to relieve the drag of the yarn, when taking up or winding upon the spool or bobbin.

In Plate VIII., fig. 1, is an elevation of a spindle and flyer, for a throstle frame on the plan of Messrs. Andrew Tarlton and Shepley's patent, with the first of these improvements applied thereto. Fig. 2, is an elevation of the same, some of the parts being shown in section, for the purpose of exhibiting the internal construction: *a, a,* is the spindle, the lower end of which turns in a step upon the copping rail *b,* and is supported laterally and kept steady by the bolster and tube *c, c,* mounted in the rail *d, d.* The flyer is formed by a disc and tube *e, e,* running upon the outside of the bolster tube *c, c*; it has four erect arms *f, f, f, f,* for conducting the thread or yarn, and winding it upon the bobbin, and is driven by a band passed round the warve *g.*

The carrier or internal bobbin *h, h,* is made of hard wood, or other suitable material, and accurately, but loosely, fitted to the upper part of the spindle *a,* bearing upon a flange *i,* fixed on the spindle with a cloth or other washer inter-

Fig. 4, is an elevation of a spindle, with the fourth improvement applied, which is particularly suited to the spinning of yarns of very fine numbers. Fig. 5, is an elevation of the same, without the flyer, the spindle and bobbin being shown in section : *a, a,* is the spindle driven by a warve *n*; it is intended to bear upon a step in a rail below, and is kept in its perpendicular position by the bolster *c*. The spindle *a*, is short, and made hollow, for the purpose of receiving a small auxiliary spindle *o*, which turns freely within it. Upon this auxiliary spindle *o*, it is intended that the yarn or thread shall be spun either upon a bobbin, as in throstles, or upon the bare spindle, as in mules. The auxiliary spindle is made very tight and tapering at both ends; it has a flange *p*, fixed about its middle, which is intended to bear upon the head of the hollow spindle *o*; and the lower end of this spindle *o*, runs either in a guide bush or collar *q*, or in a step fixed within the hollow spindle; in which latter case the flange *p*, should not bear upon the head of the hollow spindle. This arrangement of the spindle is furnished with a four-armed flyer, *e, e, f, f,* similar to that before described, which is driven by a band and warve *g*. The hollow spindle *a*, is also driven by a band and warve *n*, independently of the flyer, in order that they may be made to revolve with dissimilar speeds.

It will be perceived that the spindle and the flyer being thus driven by certain independent speeds, the relief which the bobbin may require for winding on as it increases in diameter, will be afforded by the auxiliary spindle *o*, turning freely in the hollow spindle *a*.

In adapting the first feature of these improvements, the carrier bobbin *h*, to this auxiliary spindle, the Patentee prefers that the outer bobbin or spool *k*, should be made of tin, or very thin metallic plate, or other suitable material, for the purpose of lightness, and for obtaining a smaller bobbin or spool than could be conveniently made of wood.

In conclusion, the Patentee remarks—"Having now described the features of my improvements, as applied to spinning, twisting, and doubling cotton, &c., I lastly desire it to be observed, that I do not intend to confine myself to the precise forms and dimensions shown in the drawings, but claim the employment, firstly, of a carrier bobbin, fitted upon the spindle, for the purpose of receiving the external winding bobbins, in order to render the drag at all times uniform; secondly, a loose collar or bolster, to relieve any unequal pressure of the spindle as it revolves; thirdly, extra arms to the flyer, for regulating the strain of the yarn; and fourthly, an auxiliary spindle revolving within a hollow spindle to temper the drag."—[*Inrolled in the Rolls Chapel Office, July* 1836.]

Specification drawn by Messrs. Newton and Berry.

To RICHARD BARBER, *of Leicester, cotton winder, for his invention of an improvement in reels for reeling.*—[Sealed 22nd October, 1835.]

THE subject of this Patent is the manufacturing of reels, on which sewing cotton is ordinarily wound, and produced in the market, of metal or horn, instead of wood, which is the usual material employed. Fig. 6, Plate VIII., represents a hollow tube of brass, or other metal, which is intended to constitute the barrel of the reel: on to this tube are to be affixed the ends, which are first formed, as shown at fig. 7; they consist of circular pieces of metal, cup-shaped, having several slits radiating from their centres; the several portions of metal which these slits divide are to be forced out into the shape represented at fig. 8, so that they may present a greater surface to the tube for the action of the solder. The ends being affixed to the tube, a cap stamped in a fly press, as shown in two views at fig. 9, and ornamented with any desired device, is to be placed on each; and having been adjusted in the chuck of a lathe, the edges are turned over with a burnisher or other suitable tool, which firmly secures them, and forms the finished end to the reel. On the die for shaping one of these caps, the number of the cotton, by which its fineness is indicated, may be engraved; an aperture being also left in it for the admission of the spindle in winding on the cotton. Fig. 10, represents an elevation of one of the improved reels finished.

Fig. 11, represents a partial section of the dies used for the formation of the reel ends of horn or hoof, showing so much as is necessary for the moulding of one reel: *a*, is the bottom die, having a stud or spindle *b*, projecting upwards from it; on to this spindle the tube intended to form the barrel of the reel is placed, having its ends slit and extended, in order to hold more firmly the reel end.

The tube having been thus placed, the horn or hoof previously boiled, as is usual in the process of making knife handles, &c. is deposited around it, and worked nearly into the required shape; the middle die *c*, is then to be applied, which is formed in two parts, the more easily to bring it to the tube; the separate portions being held together by a pin *d*, provided with screw nuts at the sides of the die. The horn is then to be applied for the upper end, as in the former instance, and the top die *e*, (ornamented with any required device) placed upon it; the whole being adjusted by a registering pin shown by dots, and having been subjected to a requisite pressure, the reel is withdrawn in a finished state.

The Patentee, in conclusion, states, that he does not confine himself to the manner specified for carrying his invention into effect, but claims the manufacturing of reels for sewing cotton with metal barrels, as above described.—[*Inrolled in the Inrolment Office, 22nd April, 1836.*]

To RICHARD TREVITHICK, *of St. Aith, in the county of Cornwall, engineer, for his having invented a method or apparatus for heating apartments.*—[Sealed 21st February, 1831.]

THE Patentee describes his improvements as consisting in communicating heat to private apartments, or public buildings, by means of a moveable stove, carrying a large supply of hot water to act as the heating medium; it is proposed to construct these in various forms; but as these may be modified to a considerable extent, we have not thought it necessary to present our readers with any drawings of the apparatus specified. The first modification described by the Patentee, consists of a hollow chamber suitably formed for a fire, having a moveable flue, to be adapted to the chimney of any ordinary fire-place: this chamber is surrounded by an outer casing, the intervening spaces being filled with water. When it is desired to bring the apparatus into operation, the fire is to be kindled and kept burning, until the water arrives at the boiling point; a plug valve being provided to allow the escape of the steam, if it should rise, higher. The water being at this degree, the door of the fire-place is closed, to prevent the admission of air and consequent combustion of fuel, and the moveable flue withdrawn; when the apparatus may be wheeled into the apartment which it is desired to warm, remaining there until the water has given out all the heat extracted from the fire.

The second apparatus described, is different only in being of larger construction, and having tubes passing through the body of the water, open at both ends, in order to present a greater heating surface for the action of the air.—[*Inrolled in the Inrolment Office, August,* 1831.]

To JOSHUA TAYLOR BEALE, *of Church-lane, Whitechapel, in the county of Middlesex, engineer, for his having invented an improvement in certain apparatus for separating a portion of aqueous vapour from the vapour of alcohol, in the processes of distilling and rectifying spirituous liquors.*—[Sealed 30th April, 1831.]

IN the specification of this patent, the Patentee states, that the objects of his invention are, the saving of time and risk of neglect in watching the temperature of the ordinary water bath, and the production of a purer spirit at one process, than has heretofore been accomplished in the processes of distilling or rectifying. To effect these objects, he proposes to submit the vapour arising from the wash to the action of a medium condenser, consisting of a series of pipes, containing alcohol, a solution of alcohol and water, or other fluid, a property of which must be that of arriving at the boiling point under the action of less heat than water; the effect of which will be, the condensation of those aqueous particles which arise with the spirituous vapour, while the latter will flow through the ordinary worm and tub, producing a stronger spirit than that obtained by the ordinary means, and thereby avoiding the necessity of a second process; or the same object may be accomplished by filling the condensers with water, and removing a portion of the atmospheric pressure from its surface.

Plate VIII., fig. 12, represents a section of the apparatus employed to effect this object: *a*, is the boiler of an ordinary still, set in brickwork, in the usual manner; *b*, is the still head, which is divided into two compartments by the plate *c*: from this plate, the condensing pipes *d*, extend downwards, being closed at their lower ends, but having a communication at top with the upper chamber *e*; the pipes *d*, are to be of such a number, as to present a sufficient surface for the condensation of the aqueous particles arising with the spirit; *f*, is a pipe communicating with the chamber *e*, at one end, and with an air-tight box *g*, at the other, the box *g*, being immersed in the water of the worm tub *h*; *i*, *i*, are small pipes, extending from the upper to the underside of the box *g*, being open at their ends to allow the passage of the refrigerating fluid, but rendered water-tight to the box.

Supposing the condensing pipes *d*, to be filled with some volatile fluid, as alcohol, and the process of distilling or rectifying to have commenced, the vapour arising from the wash will, after the copper has become sufficiently heated, rise into the still head *b*, and impinge upon the medium condensing pipes *d*, the fluid in which pipes will by this time also have arrived at the boiling point; but as this degree of heat is considerably lower in temperature than that of water, the aqueous particles, or a considerable portion thereof, which are mingled with the spirituous vapour, will become condensed and fall again into the copper of the still; while that portion of the vapour requiring a still greater degree of cold for condensation, will pass on by the pipe *k*, into the ordinary refrigerating worm, and there be reduced to a spirit, freed in great measure from the lowering particles attendant upon a general condensation.

The steam arising from the condensing fluid, in the chamber *e*, is conveyed by the pipe *f*, into the air-tight box *g*; and having there been condensed by the cooling surface which the water passages *l*, present, is returned into the chamber *e*, and pipes *d*, through the passage *l*; and in this manner constantly keeping a cooling surface, for the condensation of the aqueous vapour: *m*, is a pipe open to the box *g*, by which any quantity of the condensing fluid may be drawn off; and *n*, is another communication with the same chamber, by which the atmospheric pressure upon the condensing medium in the case of water being used may be governed. The claim of the Patentee, is the application of a condensing medium, consisting of a fluid boiling at a lower temperature than water, or of water submitted to the action of a reduced atmospheric pressure, for the purpose of separating the aqueous particles from spirituous vapour, whether in the processes of distilling or rectifying.—[*Inrolled in the Inrolment Office, October*, 1831.]

To WILLIAM WAINWRIGHT POTTS, *of Burslem, in the county of Stafford, china and earthenware manufacturer, for his invention of an improved method or process of producing patterns in one or more colours, to be transferred to earthenware, porcelain, china, glass, and other similar substances.*—[Sealed 3d December, 1835.]

IN vol. i. p. 126, of our Conjoined Series, will be found the description of an invention patented by the above-named William Wainwright Potts, John Potts, and Richard Oliver, for improvements in the process of obtaining impressions to be transferred to earthenware or other similar substances; under that Patent the impressions were obtained either from an ordinary copper plate or a revolving cylinder having the required pattern engraved upon them; but this method necessarily precluded the possibility of printing in more than one colour, as a second impression from an engraved plate or cylinder would injure the pattern produced by the first. The present invention consists in substituting for the engraved plate or roller, blocks similar to those now in use for calico and other printing or revolving cylinders, the patterns on which is the prominent or projecting part instead of the sunken or depressed, as in the former instance: by the employment of two or more of these blocks or cylinders, patterns of as many colours may be produced without the impressions injuring each other, each cylinder or block having its own portion of the device cut upon it, and the projections forming such portions coming in contact with separate points on the surface of the paper.

Plate VIII., fig. 13, represents a section of a machine similar to those now in use for calico printing, with the improvements added thereto: *a*, *a*, is the cast iron framing *b*, the large cylinder, around which the blanket *c*, passes, and from them, thence over guide rollers in the usual manner, the cylinder is mounted in a slot in the framing *a*, and capable of adjustment by the screw *d*; *e*, is a roller, fixed on a hollow mandril, into which steam is to be introduced, for the purpose of drying and glazing the paper on its passage through the machine; *f*, *f*, are two rollers, having each of them a portion of the device intended to be produced cut upon them; these rollers may be of any consistent number, according to the pattern required, there being one for each colour employed. The colour is fed to them through the series of conducting and furnishing rollers *g*, *g*, each set of rollers being provided with a box *h*, containing its respective colour; attached to each box is the ordinary ductor *i*, acted upon in the usual way by cords and weights, for the purpose of scraping off the superfluous colour from the surface of the roller; *k*, is a toothed wheel on the axle of the cylinder *b*, taking into pinions *l*, *l*, affixed to the pattern rollers *f*, *f*, and also into another pinion *m*; on the axle of the drying roller *e*, the wheels and pinions being precisely of the same pitch. The paper intended to be printed upon having been sized in the usual manner, is wound upon the roller *n*, and passed between the cylinders *b*, and *e*, where it is dried from the damping of the sizing material, and furnished with the requisite smoothness for obtaining a good impression; when rotary motion having been communicated to the shaft of the roller *e*, it is from thence carried by the blanket *c*, into contact with the first pattern roller *f*, where it is marked with a registering pin for the adjustment of the device: in its further passage with the blanket, it arrives in coincidence with the roller *f*, which is now brought into gear in the right position for perfecting the pattern by means of the mar impressed by the registering pin of the under roller; the bearings of the pattern rollers being capable of sliding backwards and forwards in the grooved plates *o*, *o*. The parts having been thus adjusted, the paper proceeds regularly through the machine, receiving one part of the device in one colour from the under roller, and the remaining portion upon a different part of the pattern in another colour from the upper roller, and from thence is conveyed by the blanket *c*, into any convenient situation in the usual manner.

The Patentee remarks, that this principle may be applied equally well with blocks constructed in the usual way for calico-printing, and also that many modifications of the same may be employed, he does not therefore intend to confine himself to the precise means herein specified, but claims as his invention the production of patterns in two or more colours, by any suitable means, for the purpose of trnasferring such patterns on to earthenware, porcelain, china, glass, or such other substance; the pattern being obtained from the surface, and not from the engraved cut of printing blocks or cylinders, and for the purpose only of transferring them to the above-mentioned materials.

To John Barsham, *of Stepney-causeway, in the county of Middlesex, oxalic acid manufacturer, for his invention of improvements in the manufacture of oxalic acids and salacetecella.*—[Sealed 20th February, 1836.]

The object of these improvements in the manufacture of oxalic acids and salacetecella, is to counteract the evil incident on the ordinary process from the escape of the vapour arising from the materials employed, the process pursued in the ordinary way, being effected in open pans or vessels.

The Patentee proposes to effect the evaporation from materials precisely the same as those now in use for the purpose; but instead of allowing the vapours to pass immediately from the pans to the atmosphere, he employs a series of receivers and condensers, connected to retorts, whereby the unwholesome and nauseous vapours are condensed, and removed from thence to undergo a further process of distillation.

Fig. 14. Plate VIII., represents the apparatus employed for this purpose: *a, a,* are two of a series of retorts, the number depending upon the extent of manufacture to be carried on; these are placed in a water bath, in a similar manner to the pans usually employed: *b, b,* are pipes, proceeding from the retorts, and connected at their lower ends to the receiver *c,* which communicates with a further one by the pipe *d*; *e,* is a pipe, attached to the receiver *c,* communicating with the condenser *f,* which is provided with a

passage *g*, terminating in a further condenser *h*; this last being one of a series, as many being employed as will effect a perfect condensation of the vapour. The solution to be evaporated, is placed in a suitable quantity in the retorts *a*, *a*, through the aperture *i*, which is then to be closed; and the evaporation commencing, a partial condensation will take place in the retorts, which is to be caught by the trough *k*, (seen in the sectional view of one of the retorts, fig. 15,)—from this trough it is to be conducted, together with the uncondensed vapour, by the pipe *e*, into the receivers *c*; and the vapour yet remaining, from thence, by the pipe *g*, into the series of further condensers *h*, the last one of which is to be exposed, by its pipe, to the atmosphere, in order to induce the vapour in that direction, care being taken to employ enough vessels to effect a perfect condensation: *l*, is an aperture (to be closed while the process is in operation) for the admission of a syphon for the purpose of drawing off the condensation. The crystallization is performed in the usual manner.

The claim of this patent is evaporation, whether for the purpose of manufacturing oxalic acid, or salacetecella, in closed vessels, as above described.—[*Inrolled in the Inrolment Office, July*, 1837.]

To HENRY MARTINSON ROBINSON, *of the Minories, in the city of London, paint and varnish manufacturer, for his invention of improvements in certain descriptions of lamps.*—[Sealed 18th February, 1836.]

THIS invention relates to that construction of lamps which are used for burning naptha, petroleum, essential oil, and such materials; and consists, firstly, in the application of talc plates or surfaces for the support of the wick, instead of glass or metal, as heretofore used. Secondly, in the peculiar construction of the wick-holder, which in these lamps consists of an open framing, whereby the wick can more easily be saturated with the material which is to be burned, and also in constructing the wick-holder of two separate pieces, and joining the lower ends of each by a hinge, so that when it is necessary to put in a new wick, it may be done with greater facility by lifting up one of the sides of the wick-holder, which, as it turns on a hinge, can be effected without straining the metal, as is the case in the old construction of lamps of this description. Thirdly, in applying a rack and pinion movement to the wick-holders of these lamps, so that the wick may be adjusted with great facility and precision; and fourthly, in forming the upper parts of the wick-holder and the talc plates or supporters for confining the flame of a "convex curved form," whereby a greater surface of the wick is exposed to the action of the flame, and consequently a greater light is produced. Fig. 16, represents a vertical section of one of this improved construction of lamps; *a*, being the body of the lamp; *b*, the wick-holder, jointed at its end by the hinge *c*, the wick is raised or lowered, and the light consequently adjusted, by the rack and pinion *d*, which passes it up between the talc plates or wick-supporters *e*, these talc plates also answer the purpose of confining the flame within proper limits; *f*, is the gallery or support of the glass or chimney, which is perforated for the purpose of supplying the wick with atmospheric air. Fig. 17, is a side view and section of the talc supporters, which are of a "convex curved" form. The advantages arising from the use of talc plates or supporters are, that the transparency of the talc allows of the free passage of the rays of light from the flame, whilst at the same time the heat of the flame does not act prejudicially upon the talc, in the manner it does upon glass.

The Patentee then says, " that the advantages arising from his improved holder are, that when a fresh wick is required, it may be opened by turning on the hinge *c*, as before stated, without being so liable to break upon being opened to receive the wick, as a plate of bent metal (which is the old way), the only way of opening this being dependent upon the elasticity of the metal."

The Patentee states in conclusion, "that what he claims as his invention, is the application of the talc plates or surfaces, as hereinbefore described; secondly, the constructing of the wick-holders, of an open or perforated frame, and also of forming the wick-holders of two parts, being hinged together at bottom; thirdly, he claims the rack and pinion movement adapted to these lamps, for raising and lowering the wick, and thereby adjusting the flame; but he does not claim the rack and pinion movement, as applied to lamps generally; and, fourthly, the forming of the upper parts of the wick-holders of " convex curved" form, as above described. —[*Inrolled in the Inrolment Office, August,* 1836.]

To JOHN BIRD, *of Birmingham, in the county of Warwick, gentleman, for his invention of an improved method of making and compounding printers' ink, paints, and other pigments.*—[Sealed 15th October, 1835.]

THE Patentee describes his invention of making, manufacturing, or compounding printers' inks, paints, and other pigments, in nearly the following words:—" I take any quantity of black mineral earth, such as is found upon my estate in Merionethshire, in North Wales, and in many other places, and I cleanse and purify it from any particles of slate or other debris, and, after such cleansing, washing or purifying, it becomes when dry a fine black, impalpable powder, but when wet a very fine black paste. This mineral earth is a compound which is compounded by nature, and upon examination is found to consist of the following ingredients, in nearly the proportions below stated, or nearly in those proportions; namely, alumina, forty-six parts; silica, forty-two parts; and coaly matter twelve parts. For the purpose of making printers' ink, a given quantity of this mineral earth must (after being well washed or cleansed, to clear from any impurities, as before stated) be ground up with boiled oil, or any other oil prepared for that purpose. In order to make ink for copper-plate printing, the same ingredients as are in common use at the present time are used, excepting only that instead of Frankfort black, or what is generally called by that name, a sufficient quantity of the above-mentioned mineral earth is introduced, and in paints and pigments it is mixed up in the regular proportions, and ground with the oils, spirits, and whatever other ingredients it may be deemed necessary to introduce according to the colour desired. It is also applicable to the manufacture of blacking. It is necessary here to state, that I do not mean to claim any stated proportion of mineral earth which may be mixed with other materials to make printers' ink, paint, or other pigments or blacking, nor do I intend to claim any other ingredients that may be introduced in such manufacture, but what I do claim as my invention, is the introduction of mineral earth in any proportion in the aforesaid manufacture, as before described.—[*Inrolled in the Inrolment Office, April,* 1836.]

To John Fenton, *of Sydenham, in the county of Kent, gentleman, for his invention of a composition or material, to be used as a substitute for soap.*—[Sealed 3rd April, 1835.]

This invention consists in making an addition to the process of manufacturing soap, whereby a valuable composition is obtained, which may be used as soap, or as a substitute for it. The Patentee states that he proceeds with the manufacture of soap in the usual manner, until he arrives at the point of pouring out, or what is technically called "cleansing," the materials of which the soap is composed, into frames. He then takes a sufficient quantity of a saponaceous compound composed of the common soda of commerce, and dissolved it in its own weight of water: this solution is then poured on to a quantity of new burnt lime, in the proportion of one hundred weight of lime for every hundred weight of soda used; this lime is placed in an ordinary ley-pan, the quantity of lime being always the same by weight, as that of the common soda employed, in this manufacture: this solution is then put into a boiler, and is suffered to boil; at the same time, half an hundred weight of alum, or half the weight of the soda employed, is then dissolved in its own weight of water in another boiler; and when the alum is sufficiently dissolved, and the caustic soda solution begins to boil, both the solutions are run into a receiver in the proportion of two parts by weight of the solution of soda and burnt lime, to one part by weight of the alum solution. The whole is then allowed to cool down to the temperature required for mixing easily with the saponaceous materials in the frame;

this is easily acquired by practice. The Patentee here states, that when the combined solution is poured into the frame, the whole should be kept well stirred, to make the caustic soda solution mix with the saponaceous materials already in the frame. The proportion of the solution to be poured in the frame should be about one ounce to each pound of the saponaceous materials employed in the ordinary manufacture of soap. The effect of adding the above solution is, that the soap will be caused to absorb a greater quantity of caustic ley than ordinary in this manufacture. The Patentee here states, that he does not claim particularly the exact proportions hereinbefore stated, as it is obvious that they may be slightly varied, according to the strength of the materials employed, and arrive at nearly the same result; but what he claims as his invention is, the introduction of the above solution in the manufacture of soap in whatever proportions.—[*Inrolled in the Inrolment Office, October,* 1835.]

To WILLIAM BATTEN, *of Rochester, in the county of Kent, gentleman, for his invention of an apparatus for checking or stopping chain cables, which apparatus may be applied to other purposes.*—[Sealed 11th July, 1831.]

THE invention, for which the above patent is obtained, consists of a combination of levers, by the action of which, the running out of a ship's cable may be stopped at any desired period. In Plate VIII. fig. 18, is a plan of this apparatus: *a*, represents an iron plate to be attached to the head of the vessel; *b*, is a section of the chain cable, used in the ordinary way; on the plate *a*, is mounted a curved lever *c*, turning on the centre *d*; *e*, is another lever, turning on a centre on the plate *a*, and formed at one end with an excentric cam *f*; *g*, is a cord attached to one end of the lever *e*, and passing over pulleys on the two levers. When it is desired to arrest the progress of the cable in running out, the cord *g*, is to be drawn, when the excentric cam *f*, working against the tail of the lever *e*, will cause its other curved end to close between the links of the cable, and compress it against the edge of the plate *a*, which at that point is bevelled into a suitable form, to enter between the projections of the links; *h*, is a rope attached to the lever *e*, by which the levers can be restored to their inactive position, and the cable released.—[*Inrolled in the Inrolment Office, January*, 1832.]

To THEODORE LYMAN WRIGHT, *of Sloane-street, in the parish of St. Luke, Chelsea, in the county of Middlesex, gentleman, for his invention of a certain improvement or certain improvements in machinery or apparatus for cleansing, purifying, and preparing feathers and down for domestic uses, and in the process or method of effecting the same, being a communication made to him by a certain foreigner residing abroad.*—[Sealed 31st December, 1835.]

THESE improvements in machinery or apparatus for cleansing, purifying, and preparing feathers and down for domestic uses, and in the process or method of effecting the same, consist in the construction of a peculiar apparatus, in which feathers or down are to be submitted to the operation of heat; and also, if required, to the action of steam, gases, or liquids. The apparatus is a cylindrical box or vessel, pierced with holes, for the escape of moisture or vapours arising from the feathers under operation, and is made to revolve slowly, it being heated to the required degree of temperature by any convenient means; that is, either by a fire situate near it, or by the cylindrical vessel being placed within an oven or closed stove. Within the box or vessel are placed shafts, with projecting arms on them, and are made to revolve in different directions, by which the feathers are constantly agitated while under operation; and the axle of the box or chamber is made hollow, and pierced with holes, for the purpose of admitting steam gases or purifying vapours, or liquids when requisite. When old feathers are to be dressed, which are very foul and much matted together, they will require to be washed; and, when about half dry, will be in proper order for dressing in the apparatus, but this is seldom requisite: in most instances, they will only require wetting, more or less, according to the condition they are in. A proper quantity of feathers having been placed in the vessel, they are subjected to the operation of heat, and are constantly agitated by the beaters within the cylindrical box, it being kept revolving slowly until the feathers are dry, which may be known by the steam ceasing to escape through the holes in the box. Purifying vapours, or fluids, or gases, may be also introduced into the cylinder through its hollow shaft or axle, to assist in the preparing and cleansing new feathers, or of disinfecting old feathers, and rendering them fit for domestic uses.

By this improved machinery and process, new feathers are easily cleansed and perfectly dried, and the animal oil evaporated and carried off with the steam; and old feathers, which have been used in beds and have become matted together from long use, or have been infected by diseased patients in hospitals, or otherwise, per may befectly cleansed, purified, separated, and rendered light and fit for new beds. The apparatus will admit of considerable variation; but that form which is most approved, consists of a hollow cylinder or drum, mounted on an axle, with a door for introducing and withdrawing the feathers; the axle of the cylinder being made hollow for the purpose of allowing the steam, or gases, or purifying vapours or liquids, to pass to the interior to act upon the feathers, which axle has projecting arms or pins placed radially round it. Within the cylinder are also mounted, longitudinally, other axles, each having projecting pins or arms placed round them, which are also made to revolve, and in different directions to the cylinder; and its shaft, by the agency of toothed wheels and pinions, or by any other convenient means; the feathers are thus kept in a constant state of agitation during the whole time that they are subjected to the operation of the heat, and the purifying process is going on; and are beaten, stirred, and thrown about during the time they are drying, in order that they may be all equally acted upon by the heat and the vapours. Plate VIII., figures 19 and 20, represent one of these improved apparatus, consisting of a cylinder and drum, mounted upon an axle in a wheeled carriage, placed upon railways within an enclosed fire-place or stove, and is capable of being withdrawn from the stove when a quantity of feathers have been operated upon, and a fresh supply is required to be introduced.

Fig. 19, is an end view of the apparatus, the casing at the end of the stove being taken away, and its edges shown in section; and fig. 20, is a longitudinal section of the drum or cylindrical vessel, showing the manner of arranging the radial agitators upon the longitudinal shafts and axle: *a*, *a*, is the outer casing or stove; *b*, the fire-place; *c*, the chimney; *d*, the cylindrical vessel, which may be constructed of sheet iron, or copper, in any convenient manner, and furnished with a door. This vessel has a number of small holes perforated in it for the purpose of allowing the escape of the steam, and the vapours or dust which may arise while the feathers are under operation; the cylinder is mounted upon the hollow axle *e*, and revolves with it in bearings on the carriage *f*, *f*: one end of this axle is open, and is connected in any convenient manner by a steam-tight box or joint, to a pipe leading from a steam generator; or it may be a conductor of gas or purifying vapours, the other end being closed and furnished with a winch handle by which the cylinder is made to revolve. The hollow axle *e*, has a number of small holes formed in it for the passage of steam or gases into the cylinder, and in it are inserted a number of projecting pins or agitators *i*, *i*. Two other axles *h*, *h*, are also furnished with agitators *l*, *l*; which axles turn in bearings in the ends of the cylinder, and are made to revolve independently as they are carried round with the drum, by means of the toothed wheels *m*, *m*, at their ends, which gear into the fixed toothed wheel or circular rack *n*, attached to the side frame of the carriage *f*: *o*, *o*, are railways or ledges, upon which the wheels of the carriage *f*, travel; *p*, is a door in the stove or part of the casing, which is turned up into the position shown by dots in fig. 19, when the cylinder is required to be removed; *q*, is also a door, which must be opened when the cylinder is required to be drawn out, or the fire attended to; *r*, is the door for removing the ashes from under the fire-place; *s*, is a shield to protect the cylinder from the immediate contact and intense action of the fire, and to prevent the possibility of the feathers being scorched or burned through the holes in the cylinder. This shield is mounted by a hinge joint to the frame at the back, and is suspended by a hook in the front. When a proper quantity of feathers have been placed in the cylinder, the door is to be shut and securely fastened; the carriage is then run back into the stove, and the doors *p*, and *q*, being closed, the steam or gas pipe is then to be connected to the hollow axle: the cylinder may be now put in rotary motion by turning the winch handle, when the agitators, immediately beginning to revolve, will separate, beat and throw up the feathers, constantly agitating them, as long as the operation continues. When the feathers are sufficiently cleansed, purified, and prepared, the pipe and the axle *e*, are to be disunited and the door *q*, opened, when the carriage, with the cylinder, is run out in the position shown by dots in fig. 19; the shield *s*, is then let down, and the door of the cylindrical box opened and turned round, so as to let the feathers fall into the basket or receptacle placed underneath to receive them.

The specification of the Patentee states, in conclusion:—" I would remark that, although I have shown this apparatus placed in a closed stove, yet the same may be used with good effect by merely placing it over a fire, either with or without a flue, like an ordinary coffee roasting apparatus; nor is it positively necessary that the axle *e*, should be made hollow for the introduction of the steam gases or purifying liquids, as chloride of lime in solution, or other purifying liquids, may be sprinkled over the feathers, previous to putting them into the cylindrical vessel."—[*Inrolled in the Rolls Chapel Office, June*, 1836.]

Specification drawn by Messrs. Newton and Berry.

NOVEL INVENTIONS.

Manchester, 21*st November*, 1836.

TO THE EDITOR OF THE LONDON JOURNAL OF ARTS.

Sir,—The remarks made by you in your last number on a previous article of your Journal, wherein some notice was taken of our planing machine, demand from us a full explanation of the circumstances, so far as we are concerned, connected with the insertion of that article, and render it incumbent on you to give that explanation a place in your next Journal.

It would naturally be inferred from your strictures, that the article in question had been written by some friend of our own, and that we, taking advantage of your absence from England, had improperly procured its publication in your Journal. Your readers will learn with surprise that "*it emanated*," though not directly, from your "*own pen*," from that of your sub-editor, a gentleman over whom we have no influence whatever, and of whose very name we are ignorant. We feel justly indignant that you should endeavourto shift the responsibility from yourself, and cast on us, or a friend of ours, the imputation of having put forward a false and injurious statement. This conduct is, on your part, the more extraordinary, after the occurrence of certain circumstances, which, for the information of your readers, we shall briefly detail.

Some time in the month of May last, you intimated to us your intention of publishing the specification of our tool patent, as you had previously published that of our patent spinning machinery. We then expressed to you our regret at the premature publication of the latter, and particularly requested you to delay that of the former, till we were better prepared to meet the anticipated demand from the public. We said at the same time that we should have no objection to your inserting a notice of such parts of the patent as were immediately available for public benefit. We accordingly, some time afterwards, forwarded to you a brief statement concerning our planing machine, and more particularly the reversing tool, as the basis of any notice you might think proper to take of it in your Journal. Had that statement been adhered to, you could have had no handle to introduce your subsequent strictures. It was neither "highly wrought," nor "calculated to serve one party to the prejudice of another," unless the bare mention of the advantages of a particular machine is to be so considered. We stated that the reversing tool was applicable to the old machines, and that we had ourselves applied it to a large planing machine of Messrs. Ship, Roberts, and Co. We mentioned Messrs. S. R. and Co., the makers, not as the proprietors of the machine; we did so, not in any spirit of rivalry—on the contrary; we pointed out a mode in which we found from experience their own machines might be improved.

We leave it to your readers to determine how far we are fairly exposed to the imputations cast upon us in your late strictures, and how far you have been authorised to indulge in such insinuations under the circumstances we have now detailed.

You profess a very laudable anxiety "to avoid, as much as possible, making the pages of your Journal a vehicle for trading advertisements." Nothing can be more becoming than the expression of such a feeling on the part of a disinterested editor. But with what propriety is such a declaration made on the present occasion, in reference to an article, written by your own representative, and inserted in your Journal in lieu of a more extended advertisement, which, unsolicited by us, you intended to publish?

Independently altogether of these circumstances, we should have supposed that we were sufficiently sheltered from the imputation of abusing the pages of a public journal for private purposes, by the character of the invention itself. We imagined that novel and useful inventions had a peculiar claim of their own on public attention, and more especially on that of the Editor of the Journal of Arts; and we should have expected that the person holding that office was competent to distinguish between a trading advertisement and the notice of an invention, which, whatever may be its merits, professes at least to be of no small importance to the mechanical arts generally.

As Messrs. S. R. and Co. in their late letter to you were not content to contradict merely the erroneous statement immediately affecting themselves, but, seduced by so tempting an opportunity, ventured into a sweeping contradiction of the advantages of the machine itself, we must trespass somewhat longer on your patience, while we pay them the compliment of a brief reply. Without pausing to remark on the candour and fairness of their letter, we join issue with them at once on questions of fact.

As to the superior surface, that is of course in some degree matter of opinion. Yet a little reflection would shew that it is a natural consequence of the principles on which the machine is constructed. For—not to mention that the action of the screw, being more steady than that of the chain or rack, has a direct tendency to produce a more uniform surface,—it is manifest that this is a necessary result from the operation of the reversing tool. Both sides of the cutter being employed alternately, its wear and tear is thereby diminished one-half, so as to preserve the cutting edge at the same degree of sharpness while travelling over double the extent of surface, and that under circumstances wherein the tool cannot be withdrawn to be sharpened. The advantage in this respect, where the surface is large, will be readily appreciated by practical men.

The economy of power, so far from being over-stated at one-half, we believe to amount, on the average of heavy work, to more than two-thirds. This immense saving is effected, partly by the more advantageous application of the moving power, by means of the screw and rollers, and partly by the reversing of the tool; whereby the bed, and the weight it carries, are relieved of one-half the otherwise necessary number of journeys.

As to the saving of time and labour, we are at a loss to conceive how any matter of fact can be rendered more evident than this, to any one who has seen the machine in operation. It would appear that Messrs. S. R. and Co. not only dispute the fact, but assert that the reversing tool actually loses time instead of gaining. This borders on the marvellous, and astonishes us almost as much as the statement that they came to that opinion, " after having attentively observed the operation of two of the patent machines for a considerable time." It is remarkable that this period of "considerable time" was that of a short visit with which we were favoured by a leading member of the firm of Messrs. S. R. and Co., in August last.

Although Messrs. S. R. and Co. have hazarded a strong, and, we think, not very "*judicious*" opinion respecting our machine, yet they have taken the precaution to guard it with certain limitations. They deny the saving of power to the "*extent declared.*" They assert that "a workman can perform a greater quantity of *the most general kind of work* in a planing machine, as previously constructed." This latter limitation is somewhat whimsical, since, if the application of the reversing tool be attended in any case with advantage, it is obviously where the most general kind of work is concerned. There is, however, an implied admission, not a little inconsistent with the general tenor of their letter, that the patent machine possesses, after all, certain advantages. We beg to add, that it loses none of those possessed by the old machines. The reversing tool is so adapted, that it can be rendered fixed when necessary, as in planing up to a stop ; and may be always so employed, with the same advantage as in the present mode, by those who, with Messrs. S. R. and Co., suspect that it loses time when planing in both directions.

We pledge ourselves to the fact, confirmed by every day's experience, that the patent machine, while it produces a superior surface, effects a saving of one-half the power, labour, and time, hitherto consumed. We, therefore, cannot entertain a doubt that it will, before long, be universally regarded of the greatest practical utility. This result we confidently anticipate, notwithstanding that there should be found those who, whether from error of judgment, or feelings of rivalry, or motives of mistaken interest, may do all in their power to defeat its success.

We are, sir, your most obedient servants,

JOSEPH WHITWORTH AND CO.

The Editor again begs to express his regret at the insertion in this Journal of the article on Messrs. Whitworth and Co.'s planing machine, in the form in which it first appeared, which has given rise to the present and to previous letters referring to that subject; but he cannot help expressing his surprise, that the editorial remarks which he thought it necessary to make by way of explanation, in reference to trading advertisements, should have been supposed to apply personally, or to cast any imputation upon Messrs. W. and Co., whom he clearly intended to have exonerated from any personal responsibility as to the erroneous assertions contained in it. He trusts that by the insertion of the above letter of Messrs. W. and Co., the unpleasant discussion will be closed.

SCIENTIFIC NOTICES.

NEW LOCOMOTIVE POWER.

Mr. Mullins, M.P., for Kerry, has made a very important discovery in the scientific world—the application of galvanism instead of steam, for propelling vessels and carriages. He is now building a carriage upon his newly-discovered principle; and several of the first engineers who have seen it, say there is every prospect of success; and that the discovery will eventually supersede the use of steam. The *Dublin Evening Post* claims the merit of this invention; for the Rev. J. W. M'Gawley, one of the clergymen of the Roman Catholic cathedral in that city, who, according to that journal, explained the invention to the meeting of the British Association of Science, held in Dublin, in the month of August, 1835. Mr. M'Gawley's interesting and important discovery, is stated to have already excited the deep attention of the scavans in Germany.

RAILWAYS.

The benefit which the prosecution of the numerous contemplated railways will confer upon the country, by the extended and continued employment of the labouring classes, may in some degree be estimated from the fact, that at this moment between

10,000 and 11,000 men are employed on the London and Birmingham Railway only. Upon this subject we have to notice the rejection, or rather the postponement, by the Peers, of the Bill for Mr. Stepheenson's London and Brighton Line (and of others by the House of Commons). As the consent of the major portion of the landholders and proprietors, two-thirds at least in number, must be preliminarily obtained, previously to the introduction of any bill to the notice of Parliament for a new line of railroad, such cannot be considered as a private detriment. Upon political and public grounds, a competition is desirable; and if any large speculation fails as a profitable concern, it has been attended in its prosecution by a proportionate distribution of the accumulated capital of the country to the operative mechanics and labouring classes of the community—to the increase of *their* means of comfortable subsistence, and of moral improvement; to the decrease of dependent pauperism, and its consequent evils; and to unobnoxious increase of the revenue, by the additional consumption of the necessaries of life. Our statesmen and political economists should invariably bear in mind, upon every proposal for a large expenditure in projected improvements, that even badly spent capital is not a public loss, but only a distribution of accumulated wealth through innumerable arteries of a healthy body, which returns the circulation to the State, with increased benefit to the entire system..

PARIS.

Mr. Gambart, the celebrated astronomer, Director of the Marseilles Observatory, and a correspondent of the Institute, died lately at Paris. This gentleman was well known in the scientific world, for his frequent discoveries of comets.

TELEGRAPHS.

A new telegraphic system, applicable to nautical purposes, invented by M. Claude Sala, has just been presented as laying claim to the Monthyon prize. It is described as remarkable for its simplicity, for by the aid of eight signs it produces, without difficulty, all the words of the vocabulary; and by means of two lanterns, it can carry on a nightly correspondence.—*Athenæum.*

WEAVING IN GLASS.

Signor Olivi, of Venice, has recently succeeded in bringing to perfection a manufacture which may prove of great value, and may be applied to many purposes of usefulness and luxury. It is the art of weaving a tissue from the threads made of glass. The process of which the Signor is the inventor, differs from all the attempts of the same kind that have been previously made in other countries, as it is made to take every degree of shape, from the most perfect transparency to the deepest opaque. The thread is also rendered so perfectly flexible, as to allow itself to be tied, or the tissues, when made, to be folded like silk. Another great advantage attending it is, that it resists the action of fire. The specimens which have been exhibited have called forth the highest admiration; and the brilliancy of colour given to them is altogether surprising. Although the Institution of Arts, at Venice, has awarded medals to Signor Olivi for his invention, it is said that he does not meet with the encouragement from the Austrian Government, which he expected its singularity and beauty would ensure; and a friend of his is consequently about to proceed to Paris, with a view to making it known in that city, where every thing relating to the arts is encouraged; and with the hope that his efforts will there meet with a better reward, and that the invention itself may probably be brought to still greater perfection.—*Mining Journal.*

CURE FOR POISONED SHEEP AND LAMBS, DISCOVERED BY AN AMERICAN FARMER.

These animals sometimes poison themselves by eating the small laurel, or what is called the lambs' poison. The following remedy is simple and easy:—Take an onion, cut it in two, and place a piece of it under each of the fore feet of the sick animal; and if it is too weak to keep itself upon its legs, attach the onion in such a manner that it will remain in the place where it is placed for fifteen or twenty minutes, which is a sufficient time to work a cure. I have sometimes applied an onion well bruised and softened, and I consider that it has the same effect. More than fifteen years have elapsed since I have known and employed this remedy, and it has never failed to work a prompt cure when it has been properly employed, whatsoever is the degree of the malady occasioned by the poison. This remedy is preferable to any other, because the sheep thus cured appear to be reinstated in their health, as if they had never been poisoned; whilst cures worked by the use of oil, grease, or any thing else, it generally loses its wool, and often dies before the time of shearing.—*Recueil Industriel.*

NEW PROCESS FOR IMPROVING IRON, OF WHATSOEVER QUALITY IT MAY BE. APPLIED BY MESSRS. SCHAFHAEUTEL AND THEOBALD BOEHM.

At this time, when schemes for railways multiply so fast, as well as machines of all sorts, owing to the increased and progressive development of so many branches of the arts, the discovery of these gentlemen is of the highest importance. MM. Schafhaeutel and Boehm warrant that the iron, of which they have exhibited specimens, and which equals the best Swedish iron, has been composed of the worst mineral, or of old iron already worked. Their discovery consists, it appears, of a particular combination of minerals; the application of which, during the process of refining, purifies the rough iron of the more inferior quality of metal, and of all the heterogeneous parts which it contains, in such a manner as to obtain an iron for forging; which, by its purity, its density, and its ductility, may be employed for the manufacture of steel, as well as for various other uses. The particular advantages of the method are, firstly, that the iron is finer, more tenacious, and more equal, than the forged iron obtained from the same rough iron by any other process. Secondly, that it is possible to take some of the rough iron, and of the worst quality, and convert it into excellent iron, to make it into bars, laminated plates, or iron wire. Thirdly, that by the immediate employment of rough iron, prepared by this method, the operation of smelting is avoided, and an economy of 30 per cent. is obtained; as the action of the bellows and the water power required to put these last in action, is rendered useless by this method. Fourthly, instead of charcoal, which is very dear, wood or coal may be used. The inventors of this process are provided with patents in different countries, as well as in England.

We are instructed to treat with any one with regard to the French interest.—*Ibid.*

DOUBLE STEAM-BOATS, FOR NAVIGATING RIVERS AND CANALS.

For some time the French have been occupied in constructing steam-boats, after the manner of Mr. Burden, an American. This boat is composed of two parts, each presenting the form of a double cone, and placed side by side; each of these two double cones being 150 feet long and 8 feet in diameter. These double cones are fastened together by cross pieces of wood, and the distance from the centre of the one to that of the other at the nearest point is 16 feet. A single wheel, placed in the middle, and moved by a steam-engine, gives motion to this boat, which does not draw more than 28 inches of water, and goes at the speed of twenty miles an hour; whilst the steam-boat of the ordinary construction draws 4½ feet of water, and their greatest speed does not exceed sixteen miles an hour. Mr. Burden's boat travelled between New York and Albany; but it was lost, owing to an accident caused by the inexperience of those who directed it. Another boat of the same sort, but with many improvements, suggested by the maker, Mr. Sandford, has been constructed at Prescot, in Canada; it is 179 feet long, and 36 broad. The form of its cones or cylinders is elliptical, more flattened at the base than at the summit. M. le Baron Seguier, member of the Institute, has constructed a boat after the system of Mr. Burden; it is composed of two double cones, between which is placed the mover: these two cones are 100 feet long, and they receive their impetus from a steam apparatus which presents some alterations in the machinery, as well as in the production of steam. M. Cavé, an engineer and machinist, has also constructed a double boat, for the navigation of the canal of the Somme. It differs from the preceding in its being covered by a deck, and carrying two keels and two rudders.—*Archives des decouvertes et des inventions.*

VESSELS PROPELLED BY HORIZONTAL SAILS. BY MR. G. WALLIS.

The author has constructed in America a vessel of the steam-boat kind, that is to say, having paddle wheels; but these wheels, instead of being put in motion by the help of steam, are actuated by four great sails, like the sails of a windmill, which turn horizontally. These sails turn on a pivot or centre, which is placed in the middle of the vessel, and are set in motion by the least wind coming from any direction, without losing the least part, and without the fear of the vessel remaining stationary.—*Bulletin de la Société d'Encouragement.*

THAMES TUNNEL.

As it may be interesting to our readers to know what progress has been made in this great work, we beg to present them with an extract from the last report of the directors. We have also the pleasure of adding, that the work continues advancing with every prospect of a successful termination. Since the last report, 60 feet of the brickwork of the tunnel have been completed, which, added to the quantity previously finished, makes a total of 660 feet. By this addition, the tunnel is now carried beyond the centre of the river, and is steadily approaching the Wapping shore.

As this important work now occupies a large share of public attention, the directors take advantage of the opportunity at present afforded them, to place before the proprietors a few facts connected with its progress and present state, in order to enable them to form correct opinions of the undertaking.

In the first place, it is of great importance to keep in mind this fact, viz. that when the works were stopped in 1828, that stoppage was occasioned by no difficulties of an engineering nature whatever, but solely on account of the original capital of the subscribers being exhausted. And it is of still greater importance to remember, that at that time, about 599 feet out of 1300 feet, which is the extreme length of the horizontal roadway and the shaft, were completed for the sum of about 120,000*l.* only. The directors never received of the original subscription more than 182,000*l.*; the difference between this and the former sum being 62,000*l.*, was, as has been frequently stated to the proprietors at their annual meetings, absorbed by the purchase of land, the cost of engines, machinery, stores, buildings, parliamentary and other expenses (including the cost of maintaining the works during the time they were suspended, a period of nearly seven years), and by the extra expenditure occasioned by the two irruptions of the river. These expenses are only thus generally alluded to, because they have all been submitted in detail to the proprietors.

The experience hence gained of the nature and cost of the work, enabled the engineer to form a practical basis on which to found an estimate for the execution of the remaining half of the tunnel, and which has been admitted to be a sound basis for the calculation by successive administrations, to whom application was made for an advance in Exchequer Bills, in order to enable the company to proceed with the undertaking.

The directors, before they proceed to give a particular detail of the advance made towards the completion of the tunnel since the annual meeting in March last, beg to remind the proprietors, that in their annual reports of 1835 and 1836, they endeavoured to guard against an undue expectation of progress in the first year, and they did so from three distinct considerations:—They were assured by the Company's engineer. Mr. Brunel, that o remove the old shield, and to replace it with a new one, would be the work of great expense, of slow progress, and of great danger. The expense, however, is one properly chargeable upon the whole work to be done, and must not be considered as exclusively belonging to that which has been recently completed. They are aware also from experience, that when this hazardous work was effected as it was with unexampled skill and presence of mind, that the knowledge of a vast and complicated machine, and the mode of working it, could only be acquired slowly; and that hence delay in the rate of progress was incidental to the recommencement of the works, and was to be expected for some time afterwards. Added to which, these difficulties were to be encountered under the deep part of the river, where its bed was known to be most unfavourable to the labours of the miners, and most susceptible of the fluctuating influence of the tide. Notwithstanding these difficulties, he tunnel has advanced to the extent already mentioned; and though they have retarded the progress of the work, yet the miners have acquired both confidence and familiarity in the discharge of their duties, and in the management of every part of the shield; and hence, it may be fairly anticipated, that when the deep part of the river is passed, and where none of the greater difficulties of the undertaking may make speed of less importance than safety to the men and security to the works, a quicker rate of progress will become practicable.

It may here be mentioned, that a constant and accurate inspection of the ground in advance, is maintained by means which are found perfectly efficient, and which have enabled the engineer to anticipate and avert those dangers which formerly would, in all probability, only have preceded an irruption. The accuracy of the second series of borings in the river, which was made in 1827, under the superintendence of the then resident engineer, Mr. I. K. Brunel, has been hitherto practically demonstrated by the knowledge of the ground obtained in the course of the actual excavation. This second series took place in consequence of the discovery made in the progress of the works of the inaccuracy of the first borings, which were made under the direction of Messrs. Jolliffe and Banks, and laid before the directors, shortly after the formation, but previous to the incorporation of the Company.

To enable the proprietors now to form an opinion of the state of the works, the directors submit the following details under distinct heads, which are in substance the weekly reports of Mr. Brunel to the directors.

1st. The new shield has fully answered its purpose, and has enabled the work to proceed through some portions of ground in almost a fluid state. It is greatly superior to the old one. The resistance against which it has to exert its power, is computed at about 3000 tons vertical and lateral pressure, nevertheless, it possesses both facility and precision of movement. Some idea may be formed of the extent of the excavation which it enables the miners to carry on through ground of the consistency previously described, and which it preserves until the brickwork is completed, when it is known that the whole area of the ground equal to 2000 superficial feet, over the whole of which vents are open for the infiltration of water both from the river and land-springs, which latter have been found most copious, and sometimes a source of considerable alarm and difficulty. The total area from over which such vents are opened, and through which infiltration takes place, exceeds 75,000 superficial feet.

2nd. The reservoirs and drains, the completion of which was spoken of in the last report, have been of great value. They have, under the largest influx of water, given facilities to the progress of the miners unknown before. Formerly, forty hand-pumpers, in gangs of twenty each, besides artificers in conjunction with them, were required, who greatly impeded the miners and bricklayers, and who, owing to the adoption of the reservoirs and drains, are now dispensed with.

3rd. State of the ground. Under this head the directors are desirous to state the obligations the Company are under to the Right Honourable the Lord Mayor (Mr. Alderman Copeland, M.P.) and the Navigation Committee, and also the Harbour Masters acting under them. The manner in which they have at once discharged their duty to the public, whilst they have given every possible facility to the proceeding of the engineer, calls for the strongest expressions of obligation on the part of the directors and the proprietors at large. On the suspension of the late works, a temporary covering of made ground was raised over and around the head of the tunnel consisting of gravel and clay; but in consequence of the long cessation of the works, the city authorities ordered this covering to be removed, in order to restore the navigation of the river to its usual state, which was accordingly done. Upon resuming the works, and on examining the ground, the favourable state of it enabled the engineer to proceed for a time without again resorting to the protection which it afforded; it was, however, thought prudent to obtain from the Lord Mayor permission to resort to this plan when necessary, as a precautionary measure against the great influence of the tides whilst the tunnel is being constructed under deep water. The influx of river water is discovered by its temperature, as well as by the increased quantity pumped up by the engine; and it is found invariably, that a timely resort to this expedient immediately reduces the quantity, and brings it under control. The precaution is, therefore, one essential, in the opinion of the engineer, to the security and progress of the works.

4th. Rate of progress. Since the annual meeting, 60 feet of brickwork have been completed, which, added to the 10 feet (always occupied by the shield) excavated, makes a total of 670 feet, notwithstanding the difficulties which had to be encountered on the resumption of the works, which have been already alluded to in a former part of this report. As the tunnel approaches the opposite shore, the difficulties of the undertaking will decrease. The thickening of the crust of earth, or the bed of the river over the head of the miners, will render the more rapid advance of the shield perfectly practicable; and as the works will then be carried on under shallower water, they will be less influenced by the tides.

In a report made on the 24th of August to the directors, Mr. Brunel says, "Contrasting our present state, however, with almost the whole course of June last, it will be seen that we have gained considerably in every respect. On many occasions in June, we were obliged to block up and timber the top boxes, and even to suspend our proceedings until we could approach as it were the top polings, and probe the ground; but since, and from the auxiliary means which I adopted on the 2nd of July, and made an application on that day, not one single instance is recorded of the boxes being blocked up, or of ground breaking in; on the contrary, the ground which could not be worked before, and wherein a pricker entered seven feet a-head, was worked with perfect security. We may anticipate that we shall gradually improve in progress. The auxiliary means alluded to in the foregoing report, and which can only be generally described, consist of a system of pinning and isolating a portion of ground, which is then removed without disturbing the contiguous portion from which it is taken, and which has enabled the work of excavation to proceed under the most formidable circumstances. This system, combined with a mode now adopted, of at once conveying away the land-springs and directing their course to the reservoirs, instead of attempting to stop their influx, has enabled the miners to proceed where difficulties have appeared at first almost insuperable.

Accounts of expenditure. A statement of the receipts and expenditure of the half year, ending on the 30th June last, is annexed to the report; which statement, added to those which have hitherto been laid before the proprietors, will furnish them with the expenditure which has taken place by the company up to Midsummer last.

The directore have thus endeavoured to lay before the proprietors a general view of the works, together with a statement of the expenditure of the Company. They regret to add, that owing to the illness of the family of the late resident engineer, Mr. Beamish, he has been unavoidably obliged to resign his situation, which has deprived Mr. Brunel of the zeal and professional assistance so ably afforded him by Mr. Beamish. The directors, on the recommendation of Mr. Brunel, have made a temporary arrangement with one of their assistant engineers, as it appeared that the duties of the office might be susceptible to a new and better distribution.

In Mr. Brunel, the directors continue their unabated confidence; and in conclusion, whilst they remind the proprietors that the work is one not yet free from both uncertainty and danger, they still desire to reiterate their opinion, that, at no very distant period, this great undertaking will, in spite of opposing difficulties, be completed, and a communication made between the shores of one of the deepest parts of the river, where, within a small space, the trade and navigation. London may almost be said to be concentrated: and that, in all probability, this communication will be made at less than half the pense of any communication for similar purposes within the range of the metropolis.

New Patents
SEALED IN ENGLAND,
November, 1836.

To Jeremiah Crook, of Liverpool, in the county of Lancaster, merchant, for certain improvements in the machinery for manufacturing hat bodies, being a communication from a foreigner residing abroad.—Sealed 28th October—6 months for inrolment.

To Thomas Edge, of Great Peter-street, in the city of Westminster, gas apparatus and lamp manufacturer, for certain improvements in lighting or illuminating by gas, oil, or spirit lights, or lamps, being a communication from a foreigner residing abroad.—Sealed 28th October—6 months for inrolment.

To Robert Copland, of Courlands, Wandsworth-road, in the county of Surrey, esquire, for his invention of improvements upon patents already obtained by him for combinations of apparatus for gaining power.—Sealed 5th November—6 months for inrolment.

To James Elnathan Smith, of Liverpool, in the county of Lancaster, merchant, for certain improvements in railways, and on locomotive carriages to work on such railways, being a communication from a foreigner residing abroad.—Sealed 8th November—6 months for inrolment.

To John Whitcher, of Ringwood, in the county of Hants, carrier, for his invention of improvements in drags or apparatus applicable to carriages.—Sealed 8th November—6 months for inrolment.

To James Smith, the younger, and Francis Smith, both of Radford, in the county of Nottingham, mechanics, for their invention of certain improvements in certain machinery, already known, for making bobbin-net or twist lace.—Sealed 8th November—6 months for inrolment.

To Joel Livsey, of Bury, in the county of Lancaster, cotton spinner, for his invention of improvements in machinery used for spinning, preparing, and doubling cotton and other fibrous substances.—Sealed 10th November—6 months for inrolment.

To George Bertie Paterson, of Peacock-street, in the parish of St. Mary, Newington, in the county of Surrey, engineer, for his invention of certain improvements in the construction of meters or apparatus for measuring gas or liquids.—Sealed 12th November—6 months for inrolment.

To Henry Augustus Wells, of the city of New York, but now residing in Threadneedle-street, in the city of London, for his invention of certain improvements in the manufacture of hats.—Sealed 15th November—2 months for inrolment.

To Fletcher Woolley, of York-street East, Commercial-road, in the county of Middlesex, gentleman, for his invention of improvements in the manufacture or preparation of materials to be used as a substitute for bee's-wax, parts of which improvements are applicable to other purposes.—Sealed 15th November—6 months for inrolment.

To John Yule, of Sanchiehall-street, Glasgow, practical engineer, for his invention of improvements in rotatory engines, or an improved rotatory engine.—Sealed 15th November—6 months for inrolment.

To Augustus Applegath, of Crayford, in the county of Kent, calico printer, for his invention of certain improvements in printing calico and other fabrics.—Sealed 15th November—6 months for inrolment.

To Joseph Whitworth, of Manchester, in the county palatine of Lancaster, engineer, for his invention of certain improvements in machinery for spinning and doubling cotton, wool, and other fibrous substances.—Sealed 19th November—6 months for inrolment.

To William Norris, of Alston, in the county of Cumberland, land surveyor, for his invention of certain improvements in the manufacture of combs, being a communication from a foreigner residing abroad.—Sealed 19th November—6 months for inrolment.

To John Gordon Campbell, of the city of Glasgow, in the county of Lanark, merchant, and John Gibson, of the same city and county, throwster, for their invention of a new or improved process or manufacture of silk, and silk in combination with certain other fibrous substances.—Sealed 19th November—6 months for inrolment.

To John Buchanan, of Ramsbottom, in the county of Lancaster, millwright, for his invention of an improved apparatus for the purpose of dyeing, and performing similar operations.—Sealed 22nd November—6 months for inrolment.

To Thomas Robson, of Park-road, Dalston, in the county of Middlesex, operative chemist, for his invention of improvements in firing signal and other lights.—Sealed 22nd November—6 months for inrolment.

To George Guynne, of Holborn, gentleman, and James Young, brewer, of Brick-lane, both in the county of Middlesex, for their invention of improvements in the manufacture of sugars.—Sealed 22nd November—6 months for inrolment.

To Isaac Naylor, of Stainbrough, near Barnsby, in the county of York, gamekeeper, for his invention of an alarm gun, or reporter and detector.—Sealed 22nd November—2 months for inrolment.

To Timothy Hackworth, of New Shildon, near Bishop Auckland, engineer, for his invention of improvements in steam-engines.—Sealed 22nd November—6 months for inrolment.

To Thomas Ellis, of Stamford-hill, in the county of Middlesex, esquire, and Thomas Burr, of Shrewsbury, in the county of Shropshire, for their invention of improvements in the manufacture of sheets and pipes, or tubes, and other articles of lead and other metals.—Sealed 24th November—6 months for inrolment.

To Joseph Woollams, of Wells, in the county of Somerset, gentleman, for his invention of certain improved means of obtaining power and motion from known sources.—Sealed 24th November—6 months for inrolment.

CELESTIAL PHENOMENA, FOR DECEMBER, 1836.

D.	H.	M.	
1			Clock after the ☉ 10m. 37s.
—			☽ rises 11h. 48m. A.
—			☽ passes mer. 6h. 2m. M.
—			☽ sets 1h. 12m. A.
	10	12	☽ in □ or last quarter.
		26	♃'s first sat. will im.
	21	7	♀ descending node.
2	12	35	♃'s third sat. will im.
	16	7	♃'s third sat. will im.
3			Occul. θ Vir. im. 17h. 21m. em. 18h. 24m.
4	2	5	♃ stationary.
	17	49	♃'s second sat. will im.
5			Clock after the ☉ 8m. 35s.
—			☽ rises 5h. 56m. M.
—			☽ passes mer. 9h. 50m. M.
—			☽ sets 2h. 21m. A.
	5	29	♀ in conj. with the ☽ diff. of dec. 1. 45. N.
	10	46	♃'s fourth sat. will em.
	18	4	♄ in conj. with the ☽ diff. of dec. 2. 32. N.
6	17	50	♃'s first sat. will im.
7	18	11	☿ in conj. with the ☽ diff. of dec. 2. 6. N.
8	1	0	Ecliptic conj. or ● new moon.
	12	19	♃'s first sat. will im.
9	4	0	☽ in Perigee.
	16	33	♃'s third sat. will im.
10	23	1	♀ greatest hel. lat. N.
			Clock after the ☉ 6m. 20s.
—			☽ rises 11h. 23m. M.
—			☽ passes mer. 3h. 5m. A.
—			☽ sets 6h. 55m. A.
11	17	49	♀ in conj. with ♄ diff. of dec. 0. 9. S.
12	0	30	☿ in Aphelion.
			Occul. Capri, im. 6h. 23m., em. 6h. 55m.
	22	42	♅ in conj. with the ☽ diff. of dec. 4. 25. N.
14			Mercury R. A. 17h. 24m. dec. 24. 27. S.
—			Venus R. A. 14h. 55m. dec. 14. 35. S.
—			Mars R. A. 9h. 57m. dec. 15. 40. N.
—			Vesta R. A. 17h. 26m. dec. 21. 26. S.
—			Juno R. A. 13h. 24m. dec. 5. 47. S.
14			Pallas R. A. 21h. 24m. dec. 5. 20. S.
—			Ceres R. A. 23h. 18m. dec. 15. 49. S.
—			Jupiter R. A. 9h. 22m. dec. 16. 11. N.
—			Saturn R. A. 14h. 45m. dec. 13. 40. S.
—			Georg. R. A. 22h. 13m. dec. 11. 47. S.
—			☿ passes mer. 23h. 54m.
—			♀ passes mer. 21h. 23m.
—			♂ passes mer. 16h. 21m.
—			♃ passes mer. 15h. 47m.
15			Clock after the ☉ 4m. 25s.
—			☽ rises 0h. 44m. A.
—			☽ passes mer. 6h. 33m. A.
—			☽ sets morn.
	3	52	☽ in □ or first quarter.
	9	43	♃'s second sat. will im.
	10		☿ in sup. conj. with the ☉
	14	12	♃'s first sat. will im.
20			Clock after the ☉ 1m. 57s.
—			☽ rises 1h. 59m. A.
—			☽ passes mer. 10h. 18m. A.
—			☽ sets 5h. 40m. M.
21	6	2	☉ enters Capri, winter com.
22	12	19	♃'s second sat. will im.
	16	5	♃'s first sat. will im.
23	0	15	Ecliptic oppo. or ○ full moon.
—			Occul. 47 Gemi. im. 12h. 44 em., 13h. 40m.
24	10	0	☽ in Apogee.
	10	34	♃'s first sat. will im.
—			Occul. ω' Cancri, im. 10h. 43m., em. 11h. 27m.
25			Clock before the ☉ 0m. 32s.
—			☽ rises 5h. 58m. A.
—			☽ passes mer. 1h 41m. M.
—			☽ sets 10h. 19m. M.
26	6	27	♃ in conj. with the ☽ diff. of dec. 4. 27. S.
27	3	38	♂ in conj. with the ☽ diff. of dec. 1h. 29m. S.
—			Occul. 42 Leonis, im. 7h. 57m, em. 8h. 39m.
28	14	12	♂ stationary.
29	14	55	♃'s second sat. will im.
	17	58	♃'s first sat. will im.
	23	29	☉ in Perigee.
31	3	53	☽ in □ or last quarter.
	12	27	♃'s first sat. will im

J. LEWTHWAITE, Rotherhithe.

METEOROLOGICAL JOURNAL,

FOR OCTOBER AND NOVEMBER, 1836.

1836.	Thermo'		Barometer.		Rain in inches.	1836.	Thermo.		Barometer.		Rain in inches
	Hig	Low.	High.	Low.			Hig.	Low.	High.	Low.	
Oct.						Nov.					
26	54	46	30,11	29,98		10	53	42	29,57	29,53	,375
27	52	37	29,86	29,62	,0125	11	51	30	29,49	29,39	,15
28	42	31	29,87	29,73	,075	12	45	33	29,78	29,74	,025
29	43	24	29,72	29,42		13	56	43	29,65	29,55	,055
30	37	26	29,97	29,93		14	45	34	29,67	29,54	
31	39	22	30,03	29,67		15	45	28	29,92	29,87	
Nov.						16	51	39	29,88	29,65	,0125
1	43	23	30,03	29,94		17	47	41	29,44	29,28	,025
2	53	39	29,89	29,84	,125	18	43	33	29,15	29,02	,35
3	50	34	29,70	29,59	,025	19	43	27	29,18	29,15	,075
4	46	36	29,53	29,39	,1	20	42	31	29,95	29,63	,275
5	45	36	29,34	29,14	,075	21	41	25	30,01	29,94	
6	45	26	29,38	Stat.	,05	22	41	32	29,85	29,69	,05
7	41	27	29,72	29,52	,025	23	46	35	29 ,41	29,22	,3
8	39	21	30,01	29,87		24	43	32	29,49	29,42	
9	50	25	29, 94	29,77	075	25	38	25	29,67	29,61	

Edmonton. CHARLES HENRY ADAMS.

Latitude 51° 37 32 N.
Longitude 3 51 West of Greenwich.

THE

London

JOURNAL AND REPERTORY

OF

Arts, Sciences, and Manufactures.

CONJOINED SERIES.

No. LVIII.

Recent Patents.

To JOHN HOLMES, *of Birmingham, in the county of Warwick, engineer, for his invention of certain improvements in the construction of boilers for steam-engines; which improvements are particularly applicable to locomotive engines, and to steam navigation.*—[Sealed 7th April, 1836.]

THESE improvements in the construction of boilers for steam-engines, are designed for the purpose of exposing a very extended surface of the boiler or steam generator to the action of the fire. The boiler is made of plate iron, and without small tubular flues, which are always liable to become choked with soot and dust, arising from the furnace, and which are extremely troublesome to clean.

The invention consists in constructing these improved steam boilers with hemispherical, or dome-shaped, or waggon-top-shaped compartments, one within another, the plates or partitions forming alternately water vessels and flues. The heated vapour and smoke rising from the combustion of the fuel passes up between, along, and partly round the water vessels, the flues communicating one with another through such openings as will not impede the draft.

Plate IX., fig. 1, is a section taken transversely through one of the improved constructions of boiler; fig. 2, being a horizontal section of the same, both of which are taken through the furnace and water chambers. In this instance the fuel is fed in from a hopper, and deposited upon a revolving fire-grate; but these constitute no part of the present improvement, except in connexion with the boiler, as a convenient arrangement for locomotive engines and steam vessels.

The jacket or outer casing of the boiler *a*, *a*, *a*, *a*, forms the external flue leading to the chimney; *b*, is the furnace; and *c*, *c*, the revolving fire-grate, mounted on a perpendicular shaft, which is made hollow for the passage of air, and operates as a blow-pipe to urge the fire.

The flues leading from the furnace are shown at *e*, *e*, *e*, passing up and down between, and embracing the water chambers, and ultimately conducting the smoke and vapours to the chimney *f*, which is furnished with a damper, to regulate the heat. The fuel is supplied from the hopper *g*, in small granulated pieces, gradually brought down by the rotation of a toothed roller *h*, into the shute *i*, from whence it falls upon the fire-grate *c*, within the furnace.

The fire-grate is made to travel round with its perpendicular support by means of a screw on the horizontal shaft *k*, taking into a worm wheel on the perpendicular shaft; and the toothed roller *h*, which feeds the fuel, is driven by similar means, the horizontal shaft being connected to the rotary part of the engine.

The steam generated in the water vessels by the heat of the furnace and flues, passes into the steam chamber *l*, and thence through the pipe *m*, to the cylinder of the engine; a safety valve being placed at *n*.

This construction of boiler admits of being taken to pieces for the purpose of cleaning, by first removing the jacket, and then separating the parts by unscrewing them at the joints next the flues; the other parts of the water vessels are rivetted together.

The same construction of boiler may be furnished with a fixed grate; and the same principle of construction as regards the water vessels and flues may be made of a waggon-top-shape; of which latter form a vertical section taken transversely is shown at fig. 3, and a longitudinal section at fig. 4: and fig. 5, is a horizontal section or plan view of the same, taken on the level of the furnace.

In these latter figures, *a*, is the furnace; *b*, *b*, *b*, the water chambers; *c*, *c*, *c*, the flues leading from the furnace to the chimney, and in their course passing along and between the several water chambers longitudinally, instead of ascending and descending as in the former. The furnace is to be fed with fuel in the ordinary way through a fire door in the front: water is supplied to the boiler by a pipe *d*, the lower end of which is closed, and apertures are made in the sides of the pipe for the passage of the water. The steam chamber is at *e*, and the steam passes from thence to the engine through a pipe *f*; a safety valve is applied at *g*.

Two longitudinal tubes *h*, *h*, extend along under the boiler, having small branch pipes leading into them from the water chambers: these are for the purpose of emptying the boiler when required, and of occasionally blowing off the sediment or deposit which may fall to the bottom of the water chambers.

This boiler, as the former, may be taken to pieces by unscrewing the upper parts of it, in order to clean the interior.—[*Inrolled in the Rolls Chapel Office, October,* 1836.]

To SAMUEL HALL, *of Basford, in the county of Nottingham, cotton manufacturer, for his invention of improvements in steam-engines.*—[Sealed 13th February, 1834.]

THE Patentee says, in the introductory part of his specification, that the objects of his invention apply to those steam-engines which are worked by a vacuum produced by condensation, and consist in condensing the steam emitted from the eduction aperture of an engine without injecting water, and in condensing part, if not the whole, of the steam which escapes from the safety valve. The invention also applies to re-conducting the water obtained by such condensation into the boiler, in order to prevent the necessity of introducing any water which may contain saline or other impure matters.

The invention, it is stated, does not consist in any novelty of apparatus, but in the combination of three or of five particular apparatus, heretofore known and in use separately, which apparatus are described nearly as follows:—

Firstly, I employ a sufficient quantity of metallic surfaces in the form of vessels, channels, passages, or pipes, of any convenient shape, arrangement, or construction, wholly open to the steam on its exit from the eduction aperture of the cylinder of the steam-engine; the water resulting from the condensation thereof coming in contact with the metallic surfaces, and making its immediate escape without being retained in the pipes, as was effected by my invention patented December 22, 1831. (See vol. i., p. 361, of our present Series.) The extent of such metallic surface should be about 2800 square inches for the condensation of each 60,000 cubic inches of steam per minute, when it is of the pressure of four pounds upon the square inch above the pressure of the atmosphere.

In constructing this condensing apparatus, I employ fifty thin copper pipes of half an inch internal diameter, and three feet long each, for the condensation of the above-mentioned quantity of steam at the aforesaid pressure, which quantity of steam per minute I consider as productive of one horse power.

Secondly, I use a pump, or any other proper apparatus, for passing a sufficient quantity of cold water between the series of metallic pipes; which pump is not merely for the purpose of condensing the eduction steam from the engines, but also to reduce the temperature of the water produced by the condensation to as low a point, or even lower than that of the mixture of the condensed steam and injection water discharged from the air pumps. The object is, by such application of cold water, when used in combination with metallic surfaces, and with an air pump, to produce as good, if not a better vacuum than is usually obtained in ordinary injection engines. The quantity of cold water which I employ is ten gallons, for the condensation of 60,000 cubic inches of steam per minute.

Thirdly, I adapt the ordinary air pump, in connexion with the before-mentioned two apparatus, to produce a sufficiently perfect vacuum, by carrying away both the water obtained by the condensation, and air that may have entered into the condenser through defective joints, and likewise the vapour arising from the condensed water; such vapour being more or less dense, according as the water is of a more or less elevated temperature, as is shown by the experiments and tables of Mr. Dalton and other scientific men.

This air pump, if constructed on the principle of a single action pump, should be of such a diameter, that its area may not be less than one-eighth of the area of the steam cylinder, the piston making (as is usual in most engines) a stroke equal to half the length of that of the piston of the steam cylinder, and both pistons making the same number of strokes per minute. I state this as the minimum at which the pump should be applied; but the capacity may, with advantage, be considerably increased: I commonly employ a pump of half the area of the steam cylinder, under the above-mentioned circumstances; and it may be increased even beyond that capacity.

Fourthly, I apply an apparatus for distilling water to re-place the waste that may take place in working the engine, in order to avoid the necessity of introducing into the boiler any water that may happen to contain saline or other extraneous matters; and, fifthly, I combine with these an apparatus (which I call the steam saver) for saving the steam that usually escapes into the atmosphere from the safety valve, when the pressure has become too high during the working of the engine. This apparatus causes such steam to pass into the condenser, and from thence to be returned to the boiler as distilled water.

It may be proper here to remark, that within certain limits, which experience will readily suggest, the above-mentioned proportions of metallic surfaces, of cold water, and of capacity of the air pump, may be varied; that is to say, if the quantity of cold water be diminished, the extent of metallic surfaces, or the capacity of the air pump, or both, should be increased: on the other hand, if the extent of metallic surfaces be diminished, the quantity of cold water, or the capacity of the air pump, or both, should be increased to produce the same effect.

The Patentee then proceeds to describe the drawing accompanying his specification, which is a longitudinal representation of a boiler and steam-engine, with the appendages for working, embracing the combination of apparatus which forms the subject of the patent.

Plate IX., fig. 6, exhibits this combination of apparatus in connexion with a steam-engine and boiler, parts of which are represented in section, in order to show their internal construction more perfectly: *a*, is the steam boiler; *b*, the furnace and flues; *c*, the working steam cylinder; and *d*, is the eduction pipe, which several parts are described as being all the same as in ordinary condensing engines.

The refrigerating and condensing vessel *e*, is shown in section, for the purpose of exhibiting its internal construction. It consists of an outer vessel, which is a cistern to receive cold water, containing within it the metallic surfaces above alluded to, in the form of a series of small perpendicular pipes. These pipes are passed through small holes in two horizontal plates, and are fixed therein by tight collars and packing wedged between the pipes and the holes of the plates. The pipes are open at both ends, their upper orifices communicating with a close chamber *f*, at top of the cistern, which receives the eduction steam from the pipe *d*, and their lower orifices leading to a close chamber *g*, at bottom of the cistern, which communicates with the air pump *h*.

The refrigerating cistern *e*, is supplied with a stream of cold water from the pump *i*, which being worked by a rod from the beam of the engine, forces a constant current of cold water through the pipe *k*, into the lower part of the cistern *e*; and this water flowing upwards through the cistern in its passage, cools the series of pipes in the cistern, and thereby condenses the steam as it passes through them. The water is then discharged from the cistern by numerous small branches into the pipe *l*, *l*.

The Patentee here observes, that if he were to apply an exhausting pump to the pipe *l*, the water might be *drawn* through the refrigerating cistern, instead of being *forced* through it: in which case, the pipe *k*, shown as leading from the cold water pump *i*, must be connected immediately to the reservoir from which the cold water is supplied.

The water of condensation drawn from the lower chamber *g*, of the refrigerating vessel by the action of the air pump, is forced up into a long box *m*, which is open to the upper part of the condenser, from whence it passes by a series of horizontal pipes *n*, into a similar long box *o*, on the reverse side of the refrigerator, and having become heated in its passage, is forced through the pipes *p*, and *q*, into the boiler.

The Patentee states, that though the pipes of the refrigerating vessel are in his drawing placed vertically, he does not intend to confine himself to that position, as they may be placed horizontally, or in any other convenient position.

In order to restore water to the boiler in place of that small quantity which may be lost by any accidental escape of the steam, a distilling apparatus is introduced in a box *r*, attached to the upper part of a tube partially immersed in the boiler. This distilling apparatus is supplied with ordinary water by a pipe *s*, *s*, from the cistern of the condensing vessel *e*; and the steam generated in the distilling box *r*, passes through a pipe *t*, *t*, into the refrigerator, where being condensed along with the eduction steam, it is by the air pump forced into the boiler in the form of pure distilled water.

The ordinary float in the boiler is connected by a wire to the outer extremity of a lever *v*, the reverse end of which lever carries the valve that closes the orifice of the pipe *t*; a small float in the distilling tube is in like manner connected by a wire to a lever *u*, which carries the valve that closes the orifice of the water pipe *s*; and now, when the water in the boiler is below the proper level, both these floats descend, and by so doing, draw down the levers *v*, and *u*, which causes the valves of the pipes *t*, and *s*, to be opened; the former opening a communication between the distilling apparatus and the interior of the condenser, the latter with the water in the refrigerating vessel.

Thus a partial vacuum is produced in the box *r*, by its air being drawn out through the condenser; and in consequence, the water immediately flows from the pipe *s*, into the distilling apparatus; and the box *r*, being in a partial state of vacuum, the water thus admitted boils below the ordinary temperature, and so evaporating, passes in the way described through the pipe *t*, to the condenser, and is forced by the air pump into the boiler in a pure distilled state to supply the deficiency; and as soon as that is accomplished, the floats again rise, and the distilling apparatus suspends its operations.

The apparatus called the "steam saver," is a peculiar construction of safety valve, shown at *w*, attached to a pipe *v*, leading from the boiler to the condenser. This apparatus is represented detached, and in section, upon a larger scale, at fig. 7, in order to render its internal construction evident. Two cylindrical open tubes *w*, *w*, one within the other, are fixed by means of flanges over an aperture in an auxiliary steam pipe *v*; and an inverted cylindrical vessel *y*, *y*, *y*, is passed down between them. Within this vessel *y*, two loose rods are suspended from a bridge or guide piece at the upper end, which rods are connected to sliding valves *z*, that close the steam-way of the pipe *v*.

Steam from the boiler, passing up into the pipe *v*, occupies the interior of the apparatus; and when its pressure has become greater than desired, the elastic force of the steam raises the vessel *y*; and in doing this, the rods suspended within are drawn up also. If the vessel *y*, rises but a little distance, one of the rods only is raised, which opens a small aperture in the centre of the valve *z*, and thereby allows a small escape of the steam toward the condenser; but if the force of the steam is such as to lift the vessel *y*, to any greater height, then the other rod also is raised, which draws up the slide valve *z*, and allows the steam to escape freely into the condenser, from whence it is passed again into the boiler by means of the air pump, as described.

The Patentee concludes his specification by saying, "Having now described the five several apparatus, the combination of which (within certain limitations as regards the first three) constitutes my invention. I proceed again to define and explain the extent of my claims (viz.) I do not claim the exclusive use of any one of the five apparatus herein described taken separately, some of them, if not all, having been used before; nor indeed do I claim the exclusive use of any two of them, if unaccompanied by any or either of the others, but I claim as my invention the use of the *threefold combinations* of the sufficient quantity of metallic surfaces, the sufficient quantity of cold water passing among them, and the sufficiently capacious air pump, as hereinbefore fully described, whether the said threefold combinations be used alone or combined with the distilling apparatus and steam saver, or either of them.

"I also claim the exclusive right of combining the distilling apparatus and the steam-saving apparatus, or either of them, with the above-mentioned threefold combination, or even with the two first of them, viz. the metallic surfaces and cold water passing among them, should a less air pump be used.—[*Inrolled in the Inrolment Office, August*, 1833.]

This is certainly one of the most extraordinary claims to invention that we ever met with, to say nothing of the grammatical construction of the sentence,—" I claim as my *invention* the *exclusive use* of the threefold combination of the sufficient quantity of metallic surfaces, the sufficient quantity of cold water passed among them, and the sufficiently capacious air pump." In plain English, the Patentee intends to claim the exclusive use of certain existing apparatus, wherever three of them of certain proportionate dimensions are combined so as to render them operative.

How far the exclusive use of such a combination might be maintainable under a patent, is a point of law that may be rather questionable: this, however, we shall not discuss; but the principle of extracting the heat from the eduction steam of an engine, and thereby condensing it, and conducting the water of condensation with the caloric evolved back to the generator; and also the precise construction of apparatus described above for effecting that object having been made the subject of a previous patent, we do not see how the proposed combination can be formed without an obvious infringement of an existing patent right.

Dr. Church in his specification of a patent, granted 7th September, 1833, (see vol. iv. page 233, of our present Series), says, that his invention under consideration, consisted, first, in certain variations from his plan patented in 1830, of a mode then proposed " to take up or recover heat from the eduction vapour of an engine, and transmit it to the generator."

In further explaining this invention, in the details of the specification, a vessel filled with open pipes standing upright, is described as a condenser, between and among which pipes a current of water is forced upwards. Into this vessel the eduction steam from the engine is introduced by the eduction pipe, and proceeds " through a system of descending pipes occupying the vessel. The ends of these pipes are fixed into partition plates at the top and bottom, through which pipes the eduction vapour continues its progress to the lowest point of temperature, the well of distilled water.

" The distilled water collected in the well is drawn therefrom by an air pump, whence it passes to the hot-water pump, which forces it into the boiler, and in this course it takes up a further portion of heat from the eduction vapour."

In other parts of Dr. Church's specification above alluded to, he says, " and further, my improvements consist in the means of distilling or evaporating water by the heat of the passing eduction steam, in order to supply to the boilers or generators any deficiency of distilled water caused by leakage or other escape.

" In the event of a portion of the heating medium (the condensed water) being lost by evaporation, that deficiency may be supplied by the replenisher. The replenisher is a box having two partitions, into which the ends of the pipes are inserted. The space between the two partitions is partially occupied with water surrounding the pipes, and the eduction steam passing through these pipes raises the temperature of the water in the box, causing steam to be generated therefrom, which steam proceeds by the small pipe to the chamber at the end of the box, where it unites with the eduction steam, and passes off with it through the condenser to the well (of distilled water) below."

In this apparatus of Dr. Church, there is, we presume, the sufficient quantity of metallic surfaces (the refrigerating pipes), the sufficiently capacious air pump, and the sufficient quantity of water, in threefold combination. If that is the case, where then is the novelty of the invention before us?—EDITOR.

To JAMES BROWN, *of Margaret-street, Commercial-road, in the county of Middlesex, rigger, for his invention of certain improvements in capstans and apparatus to be used therewith.*—[Sealed 14th February, 1833.]

THE design of the inventor is to render his improved capstan capable of exerting great power by the labour of only a few men: for this purpose, instead of applying leverage by means of handspikes to the capstan head, as in the ordinary construction, two rims of teeth are formed round the top of the body of the capstan; and these are to be acted upon by either a revolving worm or endless screw, or revolving pinions turned by a winch, which will cause the body of the capstan to turn slowly, but with great power.

Plate IX., fig. 8, represents one of the improved capstans, as seen in elevation: fig. 9, is a horizontal top view of the same; *a*, is a perpendicular cylindrical shaft, fixed firmly to the deck, upon which the body *b*, of the capstan turns freely. A frame *c*, fixed to the top of the stationary shaft *a*, above the body of the capstan, carries the driving apparatus.

The upper part of the body of the capstan has a ring of oblique teeth *d*, formed round its edge; and above this, on the top of the capstan, is a ring of bevel teeth *e*. A horizontal shaft *f*, mounted in the top frame *c*, has a worm or endless screw, which takes into the teeth of the ring *d*; and a short axle *g*, having its bearings in the central shaft *a*, and in the frame *c*, carries a bevel pinion, which takes into the bevel teeth of the ring *e*.

The bearings of the shaft *f*, in the top frame, are in long slots, with angular returns, something like the fastening of a bayonet, which is for the purpose of enabling the shaft to be readily lifted in and out of gear with the teeth of the ring *d*; the outer bearing of the axle *g*, of the bevel pinion is also supported in the frame *c*, in a similar way, in order to put it in and out of gear with the teeth of the bevel ring *e*. A mode of shifting these is essential, because the two toothed rings, and their driving worm and pinion, give different speeds, and, of course, cannot be both in operation at the same time.

The worm of the shaft *f*, being placed in gear with the teeth of the ring *d*, on applying rotary power thereto, by means of winches attached to the ends of the shaft, the barrel or body of the capstan will be made to revolve with a slow motion, but with great power; and thus, two men at the winches will do the same effective work as many men with capstan bars in the ordinary way.

If a quicker movement than that of the endless screw is desired, then the driving power may be applied by a winch to the axle *g*, of the bevel pinion, that pinion being put into gear with the bevel ring *e*, and the endless screw withdrawn. It should, however, be here remarked, that the Patentee proposes to employ two short axles *g*, placed opposite to each other, with bevel pinions acting in the bevel toothed ring, though only one is shown in the figure, to avoid confusion. He also contemplates a modification of the same contrivance, in which four short axles *g*, placed at right angles, with pinions taking into a bevel ring, may be employed, and made effective in giving rotary motion to the barrel of a capstan by means of winches applied to the outer ends of the axle, and turned by the labour of four men.

The particular claim of novelty consists, first, in the adaptation of a worm or endless screw to a stationary capstan head, for the purpose of driving the body of the capstan with power, at a diminished speed; and, second, the adaptation of one or more pinions for the same purpose.—[*Inrolled in the Inrolment Office, August,* 1833.]

To WILLIAM SNEATH, *of Ison Green, in the county of Nottingham, lace-maker, for his having invented or found out certain improvements in machinery for the manufacture of bobbin-net lace.*—[Sealed 21st December, 1831.]

THE improvements for which the above-recited patent is obtained, consist in certain additions to bobbin-net machinery now in ordinary use; the object of which is, to produce a variety of ornamental devices on the surface of the net, such as ranges of spots of thread, similar to those commonly produced on pillow lace.

To effect this, the Patentee employs, firstly, a series of hooks, having appropriate movements given to them at certain periods of the operations of the machinery when manufacturing plain net; which hooks engage with those particular bobbin threads that are intended to form the spots, and convey them up to the centre of the machine, where they are made to fold round the back points, which are at this time inserted into the net. In this way, by accumulated lappings of thread, the required spots are formed, and worked into the meshes of the net. Secondly, in the application of extra points acting in conjunction with the ordinary front points, for the purpose of separating those threads which have become slackened or entangled by the spotting lappings, in order to make way for the certain and correct entrance of the back points between their proper threads when in the act of taking up the ordinary meshes of the net. Thirdly, in the adaptation of an extra pusher bar and locker bar for the purpose of conducting those bobbins which carry the intended lapping threads into suitable positions for such operation.

The Patentee, in his specification, has described his invention as applicable to lace machines of all descriptions, and has exhibited numerous drawings with voluminous detailed explanations. By way of example, the mechanism is shown as applied to a circular bolt machine worked by hand; and the same is repeated as adapted to a Lever's machine; from which several drawings, we have selected one figure that will amply convey to our readers the substance of the invention.

In Plate X., fig. 1, represents a sectional view of the operative parts of a machine for making lace, or what is technically called the circular bolt principle, with the improvements applied thereto: *a*, *a*, are the circular bolts cast in leads, and screwed to the bolt bars in the ordinary manner; *b*, *b*, are the blades of the front and back locker bars, acting upon the carriages as usual, except at those periods when the spotting is required to be formed; for it is then necessary that those bobbins which carry the intended spotting threads should move from their ordinary lines of coincidence in the back bolts into the front bolts, leaving behind them, inactive in the back bolts, the carriages which are not intended to produce the spot.

To effect this movement, an extra pusher bar *c*, is applied at the back of the machine, having motion communicated to it by levers in any other convenient ordinary way.

On to this bar the pushers *d*, are secured opposite to every gate in the machine where a spot is intended to be worked: *e*, is an extra locker bar, mounted behind the ordinary back locker, which is acted upon by machinery similar to that employed for driving the ordinary lockers.

This extra locker blade has slits or saw-gates cut in it opposite to every space where the spot is to be formed, in order that the spotting bobbins may pass freely through when propelled by the extra pushers *d*, while the locker blade *e*, being solid opposite to all the other spaces, the bobbins, which are at that time used for the ordinary net, are locked back, and prevented from falling toward the middle, when the ordinary locker has fallen for the purpose of allowing the spotting bobbins to pass, or when employed for bringing them back into the back bolts. A bar *f*, is mounted on levers at each end of the machine, on which the hooks *g*, are secured: these hooks are shown detached in two views at fig. 2; they are formed of thin wire cast in leads, having their ends curved, and bent a little on one side at their points: *h*, is the front point bar, having the ordinary points *i*, screwed to it as usual; on the under side of this bar, the extra or registering points *k*, are mounted. Fig. 3, represents a detached view of a lead of these extra points.

Supposing the ordinary process of manufacturing plain net to have continued until it is desired to form a row of spots upon its surface, that operation must commence after the back points have taken up, and are still inserted between the meshes of the net, and all the carriages are in two tiers of coincidence in the back bolts, and the front point bar depressed in order to make way for the action of the hooks.

The front locker *b*, is now lowered, and the pushers *d*, come into operation by driving the selected bobbins and carriages from the back into the front bolts, they being allowed to pass through the saw gates of the extra locker *e*, whilst that locker, with its solid parts, detain the other carriages in the back combs. The hook bar is then to be lowered into the position shown in fig. 1, when all the parts will be situated as in that figure.

The hooks *g*, are now to be racked or shogged laterally two spaces to the right, when, by means of their bent ends, they will take hold of the threads of those selected carriages which are in the front bolts, and an upward movement being then given to the hooks, the threads will be severally lifted up in the form of a loop, to the elevation shown by dots. The hooks are now to be racked one space to the left, when the loops will all be laid across, or lapped upon, the points: the hooks are then again to be depressed into the position shown in the figure, and, as before, are to be racked one space to the left. The hooks are then released from the threads, and the bobbins and carriages are at liberty to be passed into the back bolts: which is done by the agency of the ordinary driving bar and locker.

The bobbins and carriages being now all in the back bolts, the guide bar is to be racked in the usual way, when the selected carriages are again passed, as before, into the front bolts, which causes a twist to be put upon the spotting threads, and binds the lapping, previously taken up, upon the surface of the fabric.

The operations of hooking up the slackened threads, lapping them over the points, and putting the twist upon them, are now to be repeated as before: and so on, for four, five, or any number of times, according to the required size of the spot.

The extra locker *e*, having been then withdrawn from contact with the carriages, which are now all in the back bolts, the ordinary operations of the machinery for forming the plain net may be pursued; observing that the last movement of the guides must place them in a correct position for starting.

Owing to the lappings which have been effected in forming the spots, the threads have become somewhat slackened and inclined from their proper lines of coincidence: to effect, therefore, their restorations to the proper vertical positions, the front points, on taking up the first half meshes, carry with them the extra points *k*, which being inserted low in the slackened threads, act as a slea for ensuring the correct entrance of the back points. The position of the points at this time is shown by dotted lines in fig. 1.

The period having now arrived for taking up with the back points, it is necessary that the extra points *k*, should be withdrawn from the threads, to allow of the twist being taken up to the centres: but in such withdrawing of the extra points, the ordinary points must not entirely leave the net; to effect this, a stop, affixed to the back point bar, comes into contact with the front point bar, as soon as the back points have effected a proper entrance between the threads; by which means the extra points are driven clear of the twist, sufficiently far to leave the ordinary points in their proper situation for protecting the half-formed mesh.

The ordinary process of making plain net is now to be continued for any number of meshes that it may be desired shall intervene between each row of spots: when, if it be required that the next spot shall not fall directly under the former one, the hook bar *f*, may be racked to the required position for forming the intended spot; or the same object may be accomplished by providing a hook for every spot in each vertical line. In such case, at the time of forming one row, half of the hooks intended to produce the other vertical range of spots will remain inactive; but their presence can be attended with no confusion, as the carriages conveying the threads which they are intended to act upon are at this time in the back bolts.

The Patentee states, that what he claims as his invention, is the adaptation of the parts above described to ordinary lace machines, for the purpose of manufacturing bobbinnet lace.—[*Inrolled in the Inrolment Office, June*, 1832.]

To THOMAS BRUNTON, *of Park-square, Regent's-park, in the county of Middlesex, Esq., in consequence of having had communicated to him by a certain foreigner residing abroad, an improvement in certain apparatus, rendering the same applicable to distilling.*—[Sealed 28th March, 1831.]

THE apparatus here alluded to is a boiler of peculiar construction, having very extended surfaces for the flame of the furnace to act against, which boiler is to be connected to and form part of the vessel that the wash is placed in when under the process of distilling.

Plate XI., fig. 1, represents a longitudinal section of the boiler, the furnace, and the flue, with a portion of the large vessel containing the wash, of which the boiler forms an extension. Fig. 2, is a horizontal view of the boiler, with the furnace in section, exhibiting the several chambers or vessels of which the boiler is constructed, and the flues passing between them : *a, a, a,* is the furnace and flue leading to the chimney; *b, b, b,* are the several chambers or vessels constituting the boiler, formed of thin metal plates connected together by rivets. One end of each chamber or vessel *b*, is open; and it is attached at the open end to the plate *c, c*, by a flange all round; the plate having long apertures formed in it, corresponding with the openings of the vessels. A partition *d*, is fixed horizontally across the middle of each vessel, leaving a passage open at the front end for the flow of the water.

The plate *c*, forms one side of the large vessel *e*, containing the wash to be distilled, which wash flows through the openings into the chambers *b*, and the flames of the furnace passing up between and around these chambers, causes the wash to be heated therein, and to flow upwards in a continual current, as shown by the arrow in the longitudinal section, fig. 1.

By this construction of boiler connected to the still, not only a greater heating surface is obtained, but such a current is produced through the boiler, as will keep the wash in continual motion all the time that the distilling process is going on.

At the back part, and within the vessel *e*, several chambers are formed as recipients for the spirituous vapour, which rises up syphon tubes, and falls into these chambers one after another in succession; the object of which is, that the spirituous vapours may be repeatedly raised and let fall again before it passes to the condensing worm, in order, as the Patentee says, that by the repeated operations of re-distilling, it shall be freed from those impurities with which it may be at first impregnated: the apparatus being intended to produce a pure spirituous liquor at once, instead of requiring repeated distillation, as in ordinary apparatus

Water is placed in the bottom of the recipients to assist the condensation, and a cold current passes under them to regulate the temperature. A refrigerator of a peculiar construction is employed in connexion with the apparatus, to condense the spirit; but this, the Patentee says, he does not claim as new.—[*Inrolled in the Petty Bag Office, September,* 1831.]

To THOMAS BRUNTON, *of Park-square, Regent's-park, in the county of Middlesex, Esq., for a communication made to him by a certain foreigner residing abroad, of an improvement in certain apparatus rendering the same applicable to steam-engines.*—[Sealed 14th April, 1831.]

THIS is a peculiar construction of boiler, designed to generate steam for working an engine. As the title appears to be rather obscure, and not pointing out the precise object of the invention, the Patentee has under the NEW PATENT LAW, been permitted by the Attorney-General to "ALTER *and* AMEND" his title, it now stands in the following words: "*An improvement in certain apparatus called boilers, rendering the same better applicable to steam-engines.*"

The objects of the improvement are to present a very extended surface of the boiler to the action of the fire, and to create a rapid current or circulation of the water within. Plate XI., fig. 3, represents a longitudinal section of the boiler with its furnace and flues; fig. 4, is a transverse section of the same; *a, a, a,* is the furnace and flues; *b, b, b, b, b,* the several projecting parts of the boiler, between and around which the flames and heated vapours from the furnace pass to the chimney *c.* The furnace and flues are nearly surrounded by a water chamber *d, d, d,* with which the projecting parts *b,* of the boiler communicate, as shown in fig. 3.

These parts *b,* of the boiler are formed by metallic bars *e*, *e*, *e*, bent as represented, to the sides of which flat plates are attached by rivets or bolts, and these portions or distinct chambers *b*, *b*, *b*, *b*, *b*, are secured to the back plate *f*, *f*, by keys or other convenient modes of attachment; their being long apertures cut in the back plate opposite the open ends of the chambers.

Very little further explanation of the construction and operation of this boiler will be necessary, as it will be perceived that the flame and heated vapours from the furnace, rising between and passing around the chamber *b*, will cause a very rapid circulation and ebullition of the water, which, rising into steam, may be conducted by suitable pipes to work the engine; and that the water in the chamber *d*, surrounding the furnace and flues, will become gradually heated, and flow into the chambers to be converted into steam.

The outer casing which surrounds the chamber *d*, should be packed with pulverised charcoal, or some other imperfect conductor of caloric, to prevent the escape of heat by radiation.

There are several variations in the construction of a boiler proposed, which are merely modifications of that described above, consisting of other contorted flues, combined with the chambers *b*, *b*, *b*, in different forms; but as the main feature of improvement is exhibited in figs. 3, and 4, it will not be necessary to extend our description farther.—[*Inrolled in the Petty Bag Office, October,* 1831.]

To THOMAS BRUNTON, *of Park-square, Regent's-park, in the county of Middlesex, Esq., for a communication made to him by a certain foreigner residing abroad, for an improvement in certain apparatus, rendering the same applicable for making or refining sugar.*—[Sealed 14th April, 1831.]

THIS is merely an adaptation of the same construction of boilers as those described in the preceding Patents, in this case intended to produce a hot-water bath, or heating medium for boiling and evaporating sugar. The boiler is formed by a series of narrow chambers opening into a large one, as shown in Plate XI., at figs. 1, 2, 3, and 4; it is closed under pressure to prevent the escape of the steam, and an open pan for boiling sugar is inserted into the water vessel or chamber of the boiler *e*, fig. 1, or *d*, fig. 3. By these means the heat of the boiling water is communicated to the syrup in the pan, which produces a very rapid evaporation of the aqueous parts, and leaves the sugar in a crystallized state.

It will not be necessary to exhibit a figure of this apparatus, as the explanation given in reference to the two preceeding patents will fully explain it.—[*Inrolled in the Petty Bag Office, October*, 1831.]

To THOMAS, EARL OF DUNDONALD, *of Regent's-park, in the county of Middlesex, for his invention of certain improvements in the construction and operation of rotary engines and apparatus connected therewith.*—[Sealed 20th December, 1833.]

THE subject of this patent is an improvement upon the rotary steam-engine, for which his Lordship (then Sir

Thomas Cochrane, commonly called Lord Cochrane,) obtained a patent, dated 11th November, 1830 (see vol. viii. of our conjoined Series, p. 404). The present feature of novelty consists, in the first place, in applying two or more rotary pistons to the engine, which is adapted to work either as a condensing or as a high-pressure steam-engine, or by compressed air or gas, the manner of doing which will be understood by reference to Plate XI.

Figs. 5, and 6, are sections taken vertically through the engine in two directions at right angles to each other; fig. 5, being cut through the axle longitudinally, fig. 6, transversely. A stationary cylinder or drum *a, a*, is fixed upon standers, and made fast to the base plate or floor; its sides or ends are closed by plates *b, b*. An axle or shaft *c*, passes through the centre of the cylinder, carrying two vanes or pistons *d*, which is firmly fixed to the central axle, and *e*, which is mounted thereon by means of a socket, and is allowed to slide upon the axis a little distance in a rotary direction.

A rotary cylinder or drum *f, f*, is placed excentrically within the stationary cylinder, it is properly packed so as to be steam-tight at its joints, and is enabled to revolve upon its gudgeons *g, g*, in recesses formed in the end plates *b, b*.

The pistons or vanes *d*, and *e*, extending from the central axle, pass through long apertures in the periphery of the rotary drum *f*, and are packed steam-tight.

The chamber or space within the stationary cylinder in which the steam is allowed to act, is by the internal excentric drum confined to a crescent, or, as the Patentee called it, a lunette shape, excepting at those parts or channels where the steam is admitted and discharged.

The steam, whether of high or low pressure, enters the cylinder or drum at the aperture *h*, and occupying the segment of the lunette chamber between the entrance *h*, and the vane *d*, the elastic force of the steam drives the vane *d*, round the interior of the drum in the direction of the arrow, until that vane has arrived in the situation of the other vane *e*: when the volume of steam occupying the chamber behind it immediately rushes through the eduction aperture *i*, to the condenser, or into the atmosphere; whilst the other vane *e*, having arrived in the position of *d*, is acted upon in the same way.

Thus the vanes or pistons are successively carried round the interior of the stationary drum, by the elastic force of the steam, and in their rotation carry the rotary drum and central shaft with them, from which shaft the rotary power is communicated for driving other machinery: the rotary drum within acting only as a guide for the vanes, and as a steam stop at the lowest point between the induction and eduction apertures.

The induction and eduction passes are proposed to be furnished with a four-way cock, by means of which the rotary action of the engine, that is, of the vanes or pistons, may be reversed when occasion shall require, or the steam may be altogether shut off.

This construction of engine may not only be actuated by steam, but also by condensed air or gas; and it may be also employed as a meter or measurer of any fluid which might be passed through it by the addition of a counting machine to its axle; it might also be used as a pump for raising water, by applying a rotary power to the end of its shaft or axle.

Another modification of rotary steam-engine having the crescent or lunette-shaped chamber, is shown at fig. 7, in which the inner cylinder is made stationary, and the outer cylinder is intended to be rotary: *a*, *a*, is the outer cylinder or drum, which is mounted, and revolves upon a stationary shaft *b*; the ends of this shaft are fixed upon standards, and the internal or stationary cylinder *c*, is made fast to the shaft in the excentric situation shown within the rotary cylinder at fig. 7.

Two flaps or leaves *d, d*, and *e*, are mounted on joints, and imbedded in recesses in the interior of the rotary drum; but in order to be brought into operation, are forced out into the positions shown in the figure, by any convenient means applied on the outside. Steam admitted at the hollow end of the shaft *b*, passes through the fixed cylinder, by a passage shown by dots into the lunette chamber below the flap or leaf *d*, and there exerting its elastic force between the flap *d*, and the steam stop at bottom, causes the outer cylinder *a*, to be driven round, until, by its rotation, the flap *d*, is brought into the situation of *e*, when it is by the stationary cylinder forced into its recess, and allowed to pass under the steam stop without obstruction, the eduction steam blowing off at the opposite opening in the hollow shaft. The other flap or leaf *e*, then comes into operation in the place of *d*, and so the outer cylinder is made to continue revolving.

In case that it might be desirable to drive the engine the reverse way, two other flaps or leaves *f*, and *g*, are mounted in the interior of the revolving cylinder, which may be brought into operation, and the flaps *d*, and *e*, laid back in their recesses when required. The induction and eduction passages being then changed, by turning the cock, the steam will be allowed to enter on the opposite side of the lunette chamber; and hence, give to the outer cylinder a reverse rotary movement.

For the purpose of applying this rotary power to the driving of machinery, a toothed rim is formed round the outer part of the revolving cylinder, from which the driving power is to be taken. Some modifications of the above are proposed, but the leading principles are those above stated.

Another feature of invention described under this patent, consists in deriving a power from the rolling and pitching of a vessel at sea, by causing a volume of quicksilver, in descending from side to side, to compress a volume of air; which compressed or condensed air being let off from a close chamber, may be applied as the elastic impelling power for working the rotary engine instead of steam.

Fig. 8, is a section taken transversely through a boat or other vessel, having a rotary engine and the pneumatic apparatus for working it. The engine, supposed to be upon one of the constructions described above, is shown at *a*. Two vessels *b*, *b*, placed below, are intended to form the air chambers; *c*, *c*, is the pipe or tube at top for allowing the air to pass from one vessel *b*, to the other vessel *b*: *d*, is a similar pipe or tube at bottom, forming a communication between the two vessels, through which the quicksilver is to flow; and *e*, *e*, *e*, is another pipe leading from each of the air chambers, and communicating with the engine. Through this pipe *e*, the compressed air is to pass for working the engine.

We presume that this figure is only intended to represent a crude example of the manner in which the Patentee proposes to apply this part of his invention, as it will be perceived that many things are wanting to render this an operative machine. The lower parts of the vessels *b*, *b*, and also the long pipe or tube *d*, are occupied with quicksilver; the upper parts of the vessels *b*, *b*, and the pipe *c*, with air. The boat, in rolling upon a rough sea, will be made to rock, and in so doing, the quicksilver will flow along the pipe *d*, from one of the vessels *b*, into the other: at that time, the elevated vessel *b*, will become filled with atmospheric air by the opening of a valve, whilst the air in the depressed vessel will, by the pressure of the quicksilver, become condensed, and be forced through a valve into the pipe *e*, and thence to the engine. Of course the depressing of the other side of the boat will produce similar effects, and thereby it is proposed to keep the rotary engine in continual motion by the force of the compressed air produced by the rolling and pitching of the boat.—[*Inrolled in the Inrolment Office, June,* 1834.]

To DANIEL DUNSCOMB BRADFORD, *a citizen of the United States of North America, but now residing in Dorset-place, in the parish of St. Marylebone, in the county of Middlesex, in consequence of a communication made to him by Solomon Andrews, residing at Amboy, New Jersey, in the said United States of North America, for an invention of certain improvements in lamps.* [Sealed 4th October, 1831.]

THE novelty of this invention consists in an improved combination of parts constituting a lamp, by means of which oil and other materials may be converted into combustible gas, and in that form burnt for the purposes of illumination.

The apparatus employed for effecting this object is shown in Plate X., at fig. 4, which represents a vertical section taken through what may be supposed to be the branch of a lamp. This lamp is supplied with oil from a reservoir by the pipe *a*, on the fountain principle, or any other convenient method: *b*, is a stop cock in the pipe *a*, for the purpose of regulating the supply of oil; *c*, is a small tube screwed into the pipe *a*, the upper part of which passes up into the interior of the burner of the lamp; *d*, is a small cup at the lower end of the tube *c*, containing ether or other highly volatile spirit; *e*, is the gallery of the lamp, supported by the tube *c*.

On the top of this tube *c*, another tube *f*, is placed, the upper part of the tube *e*, being formed slightly conical in order to hold the tube *f*, tightly.

This tube *f*, is formed from a long thin piece of plate copper, not quite parallel, but tapering on the upper edge; it is to be rolled (beginning at the broader end) upon a mandrel; and when that is done, the tube will be formed by the successive thicknesses of plate lapped in a convolute curve, the upper edge of the plate, when so coiled, rising on the outside in a spiral curve.

The burner of this lamp consists of the following parts soldered together, or otherwise attached in close connexion in any convenient manner. The part *g*, (shown also detached at fig. 5,) is what the Patentee denominates the "turret;" *h*, is the part denominated the burner, formed as the frustrum of a cone, the sides of which are perforated with minute holes for the purpose of allowing the gas to escape to be ignited; *i*, is the neck of the lamp supporting the "turret" and burner, but not soldered thereto; the joint is, however, made air-tight, in order to prevent any escape of gas.

The reason that the supporting or neck-piece *i*, is not soldered to the "turret" and burner is, that they may be removed occasionally in order to be cleaned, as the holes perforated in the sides of the burner will in time become filled up or clogged.

Having now described the construction of the apparatus, the Patentee proceeds to state in what manner it is put into operation. When the lamp is to be used the cock *b*, must be opened, and the oil allowed to flow through the pipe *a*, from whence it is forced up the pipe *e*, and also up the copper tube *f*; and in order to convert the oil into gas, a small quantity of ether, spirits of wine, or other highly volatile spirit, is poured into the cup *d*, and being ignited, the heat of its combustion volatilises the oil that is rising in the tube *c*, and converts it into carburetted hydrogen gas; and the expansive force of the gas is such as to cause it to pass rapidly through the holes perforated in the burner; and when so passed, it is ignited by the flame of the spirit in the cup *d*.

Now, when the gas has been thus ignited, the heat that it gives off will be found sufficient to volatilise the oil as it rises in the tube, and consequently, the ether in the cup *d*, is of no further use, its object being simply to volatilise the oil in the first instance when lighting the lamp.

It will be seen upon reference to the drawing at fig. 4, that the upper part of the tube *c*, is slightly contracted within; this is for the purpose of preventing the oil that is forced into the tube *f*, by the action of the fountain from being returned into the supply pipe by the expansive force of gas.

The Patentee here states, that he does not intend to confine himself to the use of a copper tube *f*, in the situation hereinbefore described, as he has found a bunch, bundle or brush of copper wires to answer the same purpose. This latter variation of the apparatus is shown in section in the detached view, fig. 6: the "turret," burner, and the neck or supporter being the same as in fig. 4; but instead of the copper tube *f*, a bunch or brush of copper wires *l*, is introduced, and fastened into the top of the tube *c*, which is constructed at its upper end in the shape of a cup, as seen in the figure, for the purpose of holding the brush of wire.

If it is required to increase the quantity of light emitted, the apparatus should be so arranged that the oil may be volatilised quicker and in greater quantities; and arms may be made to extend from the sides of the burner, as shown at *m*, *m*, in fig. 6.

It should be here observed, that the "turret," the burner, and the neck or supporter, should be made of metal well plated with silver, and brightly polished, as that metal is a good conductor of heat, and will, therefore, volatilise the oil quicker; and also that all the parts should be connected together by hard solder, in order that the solder may not be acted upon prejudicially by the heat of the flame.

The Patentee states in conclusion, that he does not mean or intend to claim as his invention the volatilisation of oil, and converting the same into gas, as before described, nor yet the introduction of the copper tube *f*, or the brush of copper wires *l*; but that which he claims as his invention, is the combination of that part denominated the "turret," with the bunch or bundle of copper wire, or the copper tube, for the purpose of volatilising the oil and converting it into inflammable gas, which may be used for the purposes of illumination.—[*Inrolled in the Rolls Chapel Office, July*, 1832.]

To JOSHUA BATES, *of Bishopsgate-street Within, in the city of London, Esq., in consequence of a communication made to him by a foreigner residing abroad, for certain improvements in refining and clarifying sugar.*—[Sealed 31st January, 1831.]

THE principal feature of this invention is a filter or strainer of peculiar construction, by means of which the liquid syrup may be cleared from the animal charcoal, and other materials that have been mixed with it, for the purpose of de-coloration, or refining the liquor, and destroying the brown colouring matter.

In Plate X., fig. 7, represents a cylindrical vessel in perspective. This is the apparatus which forms the subject of the patent, though the drawings accompany ing the specification exhibits the whole of the very extensive series of machinery employed in the preparation and clarification of syrup preparatory to its being crystallised into sugar; but which machinery being of the ordinary kind applied to that purpose, we do not think it necessary to exhibit.

The filtering vessel is formed by two solid discs at the ends, connected together by longitudinal ribs, which give the appearance of an open lantern drum, bound round by hoops; its journals at the ends are to be mounted on suitable standards, and it is to be kept in rotary motion while in use.

Fig. 8, is a transverse section taken through a part of the cylindrical vessel, showing only a few of the ribs for the purpose of explaining the internal construction of the vessel.

The discs *a*, at the ends, are held together by four longitudinal bars *b*; and between the end discs are introduced in radial positions, a series of broad ribs *c*, *c*, *c*, and a series of narrow rails *d*, *d*, *d*.

These ribs and rails being so fixed, a filtering cloth or felt of the kind commonly employed for straining or filtering syrups is passed over and under the ribs and rails, as shown at *e*, *e*, *e*, in fig. 8. In this way a series of radial bags *f*, *f*, *f*, are formed in the interior of the cylindrical vessel; the whole is then to be embraced by hoops *g*, *g*, *g*, *g*, clasped round, which give to the vessel a cylindrical figure, as shown in the perspective representation at fig. 7.

The filtering vessel so constructed is then mounted in suitable standards, so as to enable it to revolve upon its journals; and the open end of the journal at *h*, being connected to a pipe leading from the vessel, containing the syrup and purifying materials, the liquor is by that means conducted into the filtering cylinder, which, as it revolves, allows the syrup to pass through the felt or filtering cloth *e*, *e*, *e*, and drop into a receptacle placed below to receive it; whilst the animal charcoal and other matters is retained in the interior of each bag.

In the purifying process nothing very novel or peculiar is proposed; the pulverised animal charcoal and other matters are mixed with the syrup in the usual proportions; and the syrup, with these ingredients, is let off into a close pan or vessel of an oval form. This vessel is enclosed within a jacket, and steam from a boiler is let into the jacket for the purpose of surrounding and heating the syrup in the close vessel: steam is also let into the close vessel with the syrup, which, by pressing upon its surface, assists in expelling the syrup into the filtering vessel, and also in forcing it through the filter, and causing all the saccharine parts to be washed through the filtering cloth or felt, leaving the charcoal and other matters in the bags within the filtering cylinder.

The novel feature of this apparatus, as we before said, consists in the peculiar construction of the cylindrical vessel which strains the syrup from the purifying materials, or, as the Patentee expresses it, the "apparatus to filter syrup and wash the animal black and other substances used for its clarification, principally designed for the use of sugar bakers and confectioners." —[*Inrolled in the Petty Bag Office, July,* 1831.]

To JAMES BOYDELL, *Jun., of Dee Cottage, in the county of Chester, Esq., for his invention of improvements in machinery or apparatus for tracking or towing boats and other vessels.*—[Sealed 14th April, 1835.]

THIS is a mode of passing a boat over a ferry by means of a tow-rope attached to an endless chain extended across the bottom of the river. The endless chain is made to travel by the rotary motion of a drum or whimsey, as the Patentee calls it, or a capstan placed upon the land on one side of the river, round the barrel of which whimsey a portion of the endless chain is coiled.

The manner of effecting this, and the apparatus employed, are shown in Plate X., at fig. 9, which is a section taken across a river: *a,* and *b,* are the banks and landing places on each side, built up in inclined planes by masonry, in order to suit different heights of the tide; and *c,* is the ferry-boat to be conducted over.

The whimsey is shown at *d*; it may be made to revolve by manual labour, or by any other convenient means, round the barrel of which the endless chain *e, e, e,* is coiled a few times, and from whence it passes over anti-friction rollers mounted on pivots in standards secured at the bottom of the river, to a pulley *f,* on the opposite side, round which the chain passes, and returns over similar anti-friction rollers, again to the drum of the whimsey.

The ferry-boat *c,* is connected to the endless chain by a tow-rope or check-chain *g,* which, as the endless chain passes along, causes the boat to be drawn after it towards the bank. The check-chain also prevents the boat from drifting by the current of the tide, and, in conjunction with the current and the rudder, will, whether the endless chain is travelling or stationary, conduct the boat across in the manner of what is called a "flying bridge."

This apparatus, in its simple form, as shown, is suited to a river where the bottom is hard and firm, but where there is much sand and loose soil, it might be desirable to incase the chain in a tube extended across the river, which would prevent the great friction that might otherwise operate upon the chain as it travelled to and fro. The friction of the chain might also be greatly reduced by attaching to the links pieces of wood or other buoyant materials, which would cause the chain partially to float in the water.

The Patentee says, that "it will be obvious that a similar arrangement of apparatus may be readily applied for the purpose of tracking or towing boats on canals, through tunnels, and into flood-gates of docks, and similar places." Does not the Patentee know that this is, and always has been, the mode of conducting carriages through a tunnel, as at the Liverpool railway station?

In conclusion, the Patentee says, that he claims as his invention "the construction, arrangement, and adaptation of a moving chain, rope, or hawser, placed beneath the surface of the water of a navigable river, lake, or canal, for the purpose of tracking or towing boats or any other vessels." He also claims the chain rendered buoyant by the attachment of wood or cork to its links. —[*Inrolled in the Inrolment Office, October,* 1835.]

To **John Losh**, *of the Crescent, in the city of Carlisle, gentleman, for his invention of an improvement in the surface or pattern-roll of the machines used in printing calico, and other goods, commonly called surface-printing machines; and in the mode of working the said rolls.*— [Sealed 30th May, 1835.]

The improvements herein proposed, consist, first, in a mode of constructing wooden pattern rollers, for printing calicoes and other surface printing of that kind, instead of the usual copper cylinders employed for those purposes; and, secondly, in a mode of giving them rotary motion by pulleys and bands, instead of toothed gear. (See Plate XI., figs. 9, and 10.)

The novel construction of the roll is this, a suitable piece of wood is prepared by boring a cylindrical hole through it longitudinally, into which hole a cylinder of cast iron is to be introduced as a mandril, and within this an iron axle is fitted. This mandril must fit tightly into the cylindrical hole of the wooden roller, and any interstices between them must be filled up with cement made of glue, resin, or other fit material poured into the interstice in a fluid state.

When the union between the mandril and the wood has been made secure, then the compound roll, with its iron axle, is put into a lathe, and the wood turned down to a thin substance, leaving an even surface and true cylindrical figure on the outer periphery ready to be carved upon, or cut into the patterns or devices intended to be printed, or blocked, pined, and fitted in the same way as calico printing-blocks are usually made.

At the ends of the wooden cylinder shoulders or elevations are left, to form pulleys for the driving strap to be passed over; or these elevations may be made by attaching all round the ends of the rollers narrow ribs of metal equal in height to the surface of the devices formed upon the surface of the cylinder.

As cylinders of wood are liable to shrink and warp, and must then have some portions of their periphery turned off to bring them to the true figure, which will necessarily reduce their diameter, the ordinary mode of driving by toothed gear would not be practicable, because by such reduction of the cylinder its circumference would be diminished, whilst that of the driving wheels or pinions would remain the same, and consequently the pattern, or portions of the pattern, would not extend over the same surface of calico or other material as before, and therefore could not correspond or register with those parts of the pattern produced by another roller.

To remedy this inconvenience, therefore, it is proposed to drive the improved wooden roller by pulleys and straps; and as its diameter may require to be reduced in correcting its figure, to reduce the diameter of the driving pulley also in the same proportion, either by turning down its periphery, or by driving the metal ribs further into the wood.

The driving power may be communicated to the printing roller by straps or belts, from what is called the sieve roller, or any other moving part of the printing machine.

The advantages to be derived from this plan, are stated by the Patentee to be these, that he can make the register of the work perfect with a wooden surfac printing roller of any diameter, without regard to t size of the mandril or principal carrying wheel ; an the surface of the printing cylinder has become untrue, it may be corrected in the lathe, the end pulleys being turned down at the same time. The injured cylinders which were formerly completely lost, may thus be restored, and the great expense of new ones saved: and also by constructing the printing rollers in the way described, the great cost of copper rollers may be avoided. This invention, it is added, affords the means of working any number of printing rollers in a surface-printing machine at one time, with different colours, so as to produce a perfect chintz pattern at one operation.

The concluding paragraph of the specification stating the claim runs thus: " First, the elevated ends of the pattern roll so turned or formed to receive the driving band, that they may be smoothly turned or otherwise adjusted, at the same time and in like manner as the pattern on the roll; and, second, doing away with the toothed pinion wheel, and working the roller by means of driving bands or belts.—[*Inrolled in the Inrolment Office, November,* 1835.]

To JOHN LANE HIGGINS, *of Oxford-street, in the county of Middlesex, Esq., for his invention of certain improvements in the construction of, and in working vessels for navigation.*—[Sealed 26th August, 1835.]

THERE is neither beginning or end to this specification, or, in other words, there is neither introduction pointing out the features of the improvement, nor concluding summary of the points intended to be claimed as new. The explanatory part commences with " description of the drawings," and sorry drawings they are; however, we will endeavour to pick out the matters called improvements, and place them in the best way we can before our readers.

The first feature is a sort of temporary keel to be applied to a vessel which is made moveable, for the purpose of being put in, or out, of operation, as circumstances may require. This contrivance consists of circular plates, acting as lee-boards, which slide up and down in narrow grooves in the middle of the vessel over the ordinary place of a keel.

Plate X., fig. 10, represents a portion of a vessel in longitudinal section, taken through the middle: *a*, is one of the circular plates or discs suspended by cords or chains passed over pulleys *b*, *b*, and balanced by a bar *c*, which may be loaded at its ends. Two grooves are formed in uprights *d*, *d*, for the edge of the plate to slide in.

These circular plates, called by the Patentee, wheels (but which, indeed, may be square plates), are, when lowered, to answer the purpose of sliding keels or lee-boards: keeping the vessel to windward when sailing in deep water; and are to be raised up when running before the wind, or when navigating shallows. "When the vessel is going about, or when it is necessary to bear up quickly, a man, by stepping on a platform (*e*, at the end of the bar *c*,) raises the wheel up, and thereby renders the vessel more obedient to the helm."

Two of these circular plates may in a similar way be adapted in the middle line of the vessel, one near the head, as shown, the other toward the stern.

Fig. 11, represents a proposed method of adapting sliding rudder *a*, which is intended to move up down between a pair of cheeks *b*. The rudder is s pended by a chain passed over a pulley above, in order that it may be raised or lowered. This is all the explanation we can give of its improved construction.

The Patentee says, he does not claim the invention of sliding keels, but the form and mode of working them, so that if they strike the ground, they may be driven up their grooves in safety; and being made of iron, or other heavy material, will act as ballast.

Vessels intended to be propelled by steam or other power, are proposed to be made double, or in two parts, having "a run through the middle of a vessel to about the line of the draft of water," (see the transverse section, fig. 12,) with a trunk of about five or six feet in length, according to the size of the vessel, in which is suspended a double wheel, or pair of wheels, with one or more paddles revolving on the excentric *a*, (see the side view at fig. 13, corresponding to fig. 12,) which, if the reader can understand the operation of, he has a remarkably clear conception.

"The paddle-wheel may be turned by a crank or cog-wheel placed on the short spindles *b, b*. The angle of the paddle may be varied, and the length and depth of the stroke may be regulated by the connecting rods *c, c*."

It is stated then, when the vessel is sailing, the wheel to which the paddle is attached may be lowered in order to act as a sliding keel, the paddle being stationary on the upper side of the wheel.

Another contrivance is a peculiar sort of, or substitute for, a windlass. This, we presume, comes under the head in the title "of working vessels for navigation." Fig. 14, shows the apparatus in side elevation; fig. 15, horizontal view of the same. The apparatus consists of three large pulleys, *a, b, c*; on the axle of each of which, and attached thereto, is a small pulley, these are mounted on a standard frame: chains or ropes are made fast to the small pulleys of each axle, which respectively lead off to the large pulley of the next. For instance, the chain from the small pulley of *a*, leads to the periphery of the large pulley *b*; and another chain from the small pulley of *b*, to the periphery of the large pulley *c*; and the chain from the small pulley of *c*, goes to the weight or body to be raised.

This is described as a windlass for raising the mast of a vessel passing under a bridge. When the mast is nearly in a horizontal position, it requires a great power to raise it; but as it rises, the power may be progressively diminished. This windlass acts with very great power when the mast is at its lowest position, but it diminishes in power and increases in speed as the mast approaches the perpendicular; therefore no time or labour is wasted, and the mast is more expeditiously raised than by the ordinary windlass. It will be necessary to have a pawle or break, as in other windlasses; and the number and size of the pulleys must depend upon the size of the vessel or work, to which the machine is to be adapted.

Another modification of windlass for drawing up the chain-cable, and raising the anchor, is shown at fig. 16. Three wheels or rollers with ribs or arms, are mounted on axles in a frame with standards. Each arm has a notch cut in it for the links of the chain to lie in, which passes alternately under and over the wheels or rollers, as shown in the figure. The wheels are described as being turned by "winches or cog-wheels placed on the spindles;" but whether they are to be connected by gearing together, we know not.

The cable, it is said, is drawn in by this apparatus without the necessity of surging, the angles which it forms over the arms of the rollers preventing it from slipping.—[*Inrolled in the Inrolment Office, February,* 1836.]

To William Allen, *of Catherine-street, Strand, in the county of Middlesex, piano-forte maker, for his having found out or discovered certain improvements upon piano-fortes.*—[Sealed 20th July, 1831.]

This improvement is a very simple matter, and applies to piano-fortes of all constructions and forms, the framework of which is made of iron, or other metal capable of forming a firm resistance to the tension of the strings. The novel feature, is the introduction of slips of wood into suitable grooves formed in the iron framing, for the purpose of receiving the rest pins. The specification mentions no other novelty.—[*Inrolled in the Petty Bag Office, September,* 1831.]

SCIENTIFIC ADJUDICATION.

COURT OF EXCHEQUER.

JUPE *v.* PRATT.

Before Chief Baron Abinger, December, 1836.

The subject of this action was an alleged infringement of patent right. The Plaintiff obtained a patent, in March, 1835, for "*An Improved Expanding Table,*" (See vol. viii. page 73, of our Conjoined Series.) The specification described the improvement as consisting in separating the top of a circular table into several sections, and expanding it, by sliding those sections out radially from a common centre, and filling up the spaces between them with loose pieces, so as to form a large table upon the framework of what was before but a small table.

The Defendant separated the top of his circular table into four sections, and upon the old plan of Gillow's, of 1800, called a telescope table, he drew or slid out his sections in couples, by means of parallel grooves in the frame, so as to extend the surface of his table lengthwise; and having done this, he separated the coupled sections, drawing them apart in lateral directions, by similar groove slides, and filled up the spaces between by loose pieces, thus forming an extended table upon the frame of a small circular one.

Sir Frederick Pollock was leading counsel for the Plaintiff, Mr. Hill for the Defendant. The arguments were principally confined to the identity of principle between the two constructions of tables, it being contended that diverging from a common centre implied the removal of the parts of the table from the central point at which the angular sides of the sections meet and that whether they were moved in radial lines from the centre, as the Plaintiff had described in his specification, or were slidden out to their required position by means, first, of parallel grooves, and then by other grooves at right angles to the former, it was the same thing in effect; as the cutting of a round table into sections, and separating or extending them from the common centre or point of intersection, formed the subject or *principle* of the Plaintiff's invention, without reference to the means or mechanism by which the parts were separated. The Judge did not appear to acquiesce in this opinion, but the Jury, after some deliberation, gave a verdict for the Plaintiff.

To the Editor of the London Journal of Arts and Sciences.

JUPE *v.* PRATT.

SIR,—On the occasion of the recent trial, some doctrines and opinions have been put forth, which are at variance with the notions that I have previously entertained, both on the subject of Patent-Law, and on certain questions of mechanical science. If I have been in error, I have been so in common with great numbers in the mechanical world, and, therefore, I hope to stand excused in calling public attention to the subject, that we may be corrected, if wrong, by an expression of public opinion.

My opinion on one portion of Patent-Law has hitherto been, and, notwithstanding the issue of the present case, I must confess, still is, that *the monopoly of a Patentee, under his grant, is rigidly confined to those means which are described and specified by himself to be essential or conducive to the exercise of his invention.* By a proviso in the Letters Patent, he is called upon to declare what is the precise nature of his invention, and by what especial means he carries the same into effect. He is bound fully and adequately to describe or delineate every part of that which he employs in the accomplishment of his purpose; and he must state explicitly which of those parts he considers to be new, and as such to belong to him as an inventor. To these new means only, according to common interpretation of patent-right, is he entitled to an exclusive use during the term of his monopoly; and the rights of the public, which are deeply implicated in the contract, imperatively demand so rigid a prescription of the monopolist's claim. Under his grant he is protected for a term, and in justice protected, in the exclusive right to his invention; but he must not be allowed to bring within the meshes of his monopoly, contrivances which he has not made, and which are already, perhaps, or may chance in ordinary course to come from other sources, to be common property.

On the late trial, it appeared to me that Sir Frederick Pollock deviated in an extraordinary degree from his rigid and, I had thought, settled interpretation of the conditions of the contract between the inventor and the public. I understood him to argue that a

Patentee is not strictly limited in the exercise of his monopoly to those precise means which he has himself specified to be necessary, and to be used by him in the execution of his invention. Other, and widely different, means of coming at the same end, although subsequently devised, even by another person, he seems to hold, may be brought within the Patentee's monopoly, under the specious plea of mechanical equivalents. The employment of totally different means he does not consider to constitute a different invention, if they both tend to the accomplishment of the same object. Under this doctrine, the patent is granted for the end, not for the means; and the first machine for any specific purpose may be held to embrace all others for a similar purpose, however dissimilar in parts and in arrangement; he would, by a parity of reasoning, say that the subordinate parts of the first machine, are merely substituted in the others by mechanical equivalents; and, therefore, the latter are mere imitations of the original machine, and palpable infringements on the first inventor's rights. Hence we could have only one patent spinning machine, one patent loom, one patent steam-engine, and so on.

It may be deemed presumptuous in me to dissent from so high a legal authority as that of Sir Frederick Pollock, but I cannot bring myself to the adoption of his opinion on this point; and certainly the issue of patents has not conformed with his doctrine in this case promulgated; nor have the general decisions of juries in patent causes gone to the maintenance of such opinion.

We shall see presently the extreme latitude which he gives to this doctrine of mechanical equivalents; and, probably, I shall dissent as widely from the learned gentleman's notions in mechanical science, as I now presume to differ from him on a question of Patent Law.

The plaintiff in this cause, Mr. Jupe, in the year 1835, took out Letters Patent for an invention of an improved expanding table, which in his specification he sets forth in the following terms:—" The object of my invention or improvement is so to construct an expanding table, that the sections which compose the surface of the original or unexpanded table may be caused to *diverge from a common centre*, so that the table may be enlarged or expanded by inserting leaves or pieces in the openings or spaces caused by the diver-

gence of the sections from a common centre." He goes on to say—"Having thus generally stated the nature of the invention, and the object to be obtained, I would remark that there are various mechanical arrangements by which the invention may be performed, depending partly on the taste of the individual for whom a table is to be constructed. I therefore propose to describe the different arrangements of parts which I have made, and find to answer; and which, from experience, I can state will give full effect to my invention or improvement. But my improvement is applicable not only to the precise arrangements hereinafter shown and described, but to various other forms of the same table, provided the property *of expanding the surface of the original table by causing the sections to diverge from a common centre, be retained*, and the table be enlarged or expanded by inserting leaves or filling pieces in the spaces caused by *such divergence*, in the manner hereinafter mentioned." This language is sufficiently indicative of the master-notion which had governed the inventor's mind, namely, *the division of the surface of his table into sections which were to be made to diverge from a common centre.*

The Patentee then goes on to describe and delineate various forms and modifications of his invention, in all of which the surface of his original table is divided into sections more or less numerous, by lines of separation radiating from a common centre.

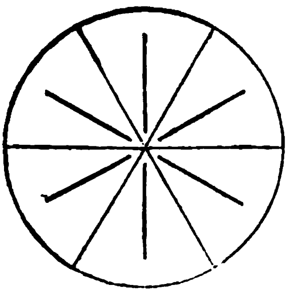
After adverting to several figures which show the surfaces in their closed end in their expanded conditions, he says, "In the several figures *a*, *a*, are the sections of the surface of the original or unexpanded table; these sections being so arranged that they are capable of diverging in radial grooves, or are controlled to move in radial directions, as will be hereafter described."——"I propose, first, to describe the construction of a table in which the sections *a*, *a*, are drawn outward by hand: I afterwards intend showing constructions in which the sections are caused to diverge simultaneously by turning the surface and bed of the table round the pillar." Again, "The pieces of metal *g*, fixed on each of the pointed ends of the leaves, take into grooves or notches formed round the metal centre-pin or button *h*, and project over and under, to complete the junctions at the centre, and to give required strength." After describing various contrivances for shooting out the sections simultanoously, and other details of construction, the Patentee, towards the conclusion of his specification, says, "And further, that the surface of the table may be divided into more or less sections than those herein shown, to suit different shapes and sizes; also that a portion of the surface in the centre part of the table may be left fixed to the bed, the sectional leaves or filling up pieces being shaped accordingly; but I think this is not so convenient a mode of carrying my improvement into effect. I would remark, that, according to the description and the various figures of the drawings, it will be seen that the sections *a, a,* diverge in parallel and radial guides *d*; but it is not essential that such guides should be radial, though I believe it will be preferable, for it will be evident that the sections *a, a,* may diverge from a common centre in directions not truly radial." He concludes thus:—"Having thus described the nature of my invention, and the manner of carrying the same into effect, I would remark, that I do not claim the various parts separately, of which the same is composed; nor do I confine myself to the precise manner of moving the sections *a, a,* of the surface of the table; but I do declare that my invention of an improved expanding table consists in constructing the same, so that the sections *a, a,* of which the original or unexpanded table is composed, may *diverge from a common centre,* and the table be enlarged or expanded by inserting leaves or pieces in the openings or spaces caused by the divergence, as hereinbefore described."

Now from the passages of the specification here cited, and from the whole of the descriptions and drawings of his several modifications of table, I can only collect that the Patentee had one prevailing dominant idea, which shaped and bounded his whole invention; and this was the radial divergence from a common centre of the sections into which he might choose to divide the surface of his table, whatever might be the original or the intended ultimate form. The means which he employs are all in strict conformity with this ruling notion; and he only adverts occasionally to some trivial deviation from his adopted plan, in order to guard himself from encroachment by an evasion. In corroboration of the testimony of the entire specifications to the correctness of this opinion, one of Mr. Jupe's witnesses on the trial told the Court that the Patentee came to him with a model of his table in card-board, consisting of sections radiating from a common centre, and requested him to invent some means of causing the sections to move out simultaneously, which he did; and that the mechanical means for that purpose described in the specification, were his, the witness's, invention. But as this radial divergence pervades every description of means employed by the inventor throughout his specification, I hold that this is the essential characteristic, the peculiar principle of his invention; and, consequently, that his claims, as an inventor, are rigidly confined to the particular mode of expanding tables by the aid of fixed guides, which cause the sections to move in radial lines diverging from a common centre.

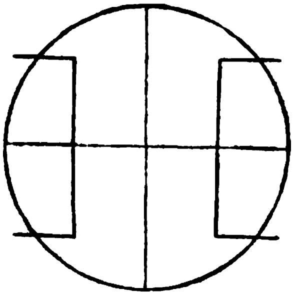
The Defendant in this cause, Mr. Pratt, had constructed a table which was, in fact, an improvement on the expanding table of Gillow, long since thrown open to public manufacture, as the Patent has expired more than twenty years. Mr. Pratt's improvement consists in giving lateral extension to the table by repeating the original motion in a direction at right angles to the first. The two semi-circular halves of the table are each divided into quadrants, which are separated from each other to gain more breadth, when the two halves have been drawn apart to the desired extent, and the interspaces are filled up in the usual way by supplementary rectangular leaves. The alteration of Gillow's table effected by Mr. Pratt, was derived from a deduction so perfectly obvious, and accomplished by means so entirely in accordance with those in use previously in the table, that it would seem Mr. Pratt was not at all conscious that he had been committing one of those violent efforts of genius which demand the monopoly of a patent; he made the table in its improved form, and left it open to all the world to profit by his example.

The distinctive characters of the Plaintiff's and of the Defendant's inventions, as drawn from their respective prescribed lines of motion, will be understood by inspection of the two following diagrams :—

No. 1.



No. 2.



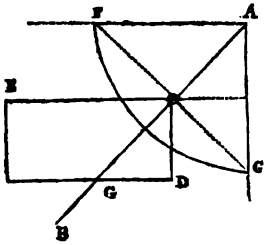
No. 1 shows the motion of Mr. Jupe's sections, on radial lines diverging from a common centre.

No. 2 exhibits the paths of motion of the two halves of Mr. Pratt's table, in two parallel right lines, and the motion of the quadrants at right angles to the former, and directed outwards to gain lateral extension.

It appears to me that these two inventions have nothing in common in their fundamental mechanical principles.

In Mr. Jupe's specification, there are described and delineated tables with the surface divided into various numbers of sections, as it is apparent that his principle will apply to any moderate number, from three, inclusive, upwards. It was not pretended that the Defendant had infringed generally on the plan of all these tables; from which impartial people might infer that he had not touched the principle of the Plaintiff's invention at all; for had he done that, the infringement must have been discernible in every one of the modifications of Mr. Jupe's table, since they are all built upon what I consider to be the radial principle which has pervaded his invention from the first to the last; namely, the motion of his sections on radial guides diverging from a common centre. But amidst the variety of tables which Mr. Jupe had elaborately set forth in his specification, was one with the surface parted into four sections, this was the isolated form of Mr. Jupe's invention, against which the sin of infraction of an exclusive right had been committed. The Defendant's table had four sections; it was the natural consequence of the course of improvement which he was pursuing, he had subdivided the originally bisected table of Gillow, and had provided for his quadrants the same kind of movement which had before been given to the two halves. But the offence did not consist in his having thus stumbled inadvertently upon number four for his sections; Mr. Jupe had no monopoly for the section of table-surfaces into any number of parts above two. The plagiarism was far more recondite, and more cunningly hidden from the vulgar eye; it called for the astuteness of a profound mechanist to detect it and drag it forth to public reprobation. Sir Frederick Pollock, the Plaintiff's leading counsel, set forth to the jury that the infringement was to be inferred, not from the Defendant having adopted any of the peculiar contrivances set down and described in Mr. Jupe's specification, as being necessary to the performance or execution of his invention; no, the defendant had not been so barefaced as to do the same thing in the same way; but he had accomplished the same end by different means; he had effected his guilty purpose by the substitution of a mechanical equivalent. This doctrine of a mechanical equivalent, offering to me, I must confess, a new feature in patent-law, formed the theme and the burthen of the learned counsel's address, as it was manifest that it could be only on the admission of this doctrine by the jury that there hung any hope of a conviction of the Defendant.—Mr. Carpmeal was called as the first witness on the plaintiff's side, and was for a long time under examination. He stated, on oath, that, in his opinion, the inventions of the Plaintiff and of the Defendant were identical; that the Defendant had substituted for the Plaintiff's peculiar contrivance what was well known to be merely a mechanical equivalent. In confirmation of this opinion, Mr. Carpmeal said, that he could make the sections of the Defendant's table, by compounding the two motions, to describe the radial paths peculiar to the Plaintiff's. The manual attempt upon the Defendant's model to elicit a diagonal from the two rectangular motions, was not singularly successful; but another model of Mr. Pratt's table had been prepared, with a very grotesque appendage of crucial iron-work, which certainly annihilated the distinctive character of the Defendant's invention, and reduced it to the standard of usefulness of the Plaintiff's; the Defendant's sections were made to travel willy-nilly in radial lines diverging from a common centre. It struck me as very like the proceeding of a wrong-headed naturalist, who should put a man in manacles and gyves, and then define him to be an animal of very restricted powers of motion. Other witnesses were called to testify to the sameness of the inventions. It seems to be a practice inexpressibly ludicrous, to pursue a question in the certain sciences by the medium of *opinions on oath*, adduced to fashion the judgments of a set of men who may be presumed (without disparagement to individuals) to be entirely incompetent to follow the train of a demonstration. The results of motion and the relations of quantity, are not themes for opinion; they are measurable and ponderable, and reducible to absolute and demonstrable certainty. The mind engaged in the investigation of them can only be in one of two states on any definite point in the inquiry, that of knowledge or that of ignorance. Here is no vague medium for the generation of opinion, no questionable ground on which to base belief: yet, when issues involving questions of pure science, come to be tried in our courts of law, lawyers call upon men to swear, so help them God, that it is their opinion and belief that two and three do not make seven, or some other equally ascertainable certainty.

In the present cause, the Plaintiff's case was made to rest on an assumption that the Defendant had, for the purpose of invading a monopoly right, sought to effect by a substitutive movement, that which was effected by dissimilar means in one particular modification of the Plaintiff's invention. This was a singular charge to be maintained, confounding as it does, all admitted notions, that a Patentee's monopoly is rigidly restricted, as in justice to the public it must necessarily be, to those specific physical means of accomplishing an end, which he has described and claimed to be his invention; and which, to substantiate his claim to the monopoly, must be new, and not previously known to have been publicly used for that particular purpose. To appreciate fully the fallacy by which this monstrous charge was sought to be supported, it will be necessary to investigate a little more critically than was done in court the nature of the two contrivances which were so summarily confounded and were so roundly asserted to be identical, and were to be considered by the jury merely as mechanical equivalents one of the other. And as I am addressing men conversant with mechanical inquiries, not a special jury in a court of common law, I shall be readily followed in my investigation by lines and figures, and shall infallibly be detected if I draw false conclusions.



Let A, F, C, be a quadrantal sector of either of the two tables. By the Plaintiff's system, the material plane A, F, C, can only move upon an unyielding guide lying in a radial direction A, O; consequently the point O, can only move in the right line O, B. By the Defendant's system, the plane A, F, C, has motion in two directions, A, F, A, C, and these two motions can be employed within their physical limits simultaneously, or in succession in every possible ratio to each other. Consequently, under this system, the point O, having motions O, E, O, D, can be made to traverse or settle upon any point in the rectangular area E, D. The motion of any one point in these cases, of course indicates like motion of all the other points of a material plane.

Now it has been asserted and sworn to in this cause, that these two systems of motion, namely, that which commands the whole of the plane E, D, and that which can only act upon the right line O, G, are identical and equivalent; and that the power of motion over the plane has been adopted to circumvent the power of motion on the right line. If such monstrous distortion of facts, such utter confounding of mechanical principles, such reckless disregard of right reasoning be permitted, where is the rule to be sought for which shall define the boundaries of right, either of inventors or of the public? Yet upon such a course of fallacious showing a special jury has been influenced to give a verdict in favour of the party resting his claim on these hollow pretensions. These judges could not surely be aware that their decision went to give to a Patentee long after he had defined his object, and specified his means, and settled his claim, the monopoly of an invention not his own, nor even hinted at in his specification.

The Defendant's system of motion, as commanding the whole area E, D, can of course command every point of the right line, O, G, which traverses it; but as he had no object in settling the point O, upon any part of the right line O, G, so has he devised no especial means for attaining that end. Having contemplated and achieved a much more expanded field of motion than the Patentee, there appears to be no possible inducement for him to bring himself down to the very restricted range of the latter. If, in the composition of the motions O, E, O, D, by a fortuitous assumption of ratios, the point O, in the Defendant's table, should be brought to rest upon the right line O, G, the only coincidence of result would be, that the Defendant's and the Plaintiff's tables in their expanded forms had been extended longitudinally and laterally in the same proportions. But as the Plaintiff has no patent for any definite proportions in his lengths and breadths, no infringement could be inferred from so casual a coincidence of form.

In my opinion, the verdict in this case is fraught with manifest injustice, as giving virtually to the Plaintiff an invention which does not come within the scope of his patent; as throwing upon the Defendant a load of expense which no one act of his had warranted, in reparation of wrong done; and as taking from him, and from the rest of the public, the free use of an invention which had become a common right.

CHARLES TOPLIS, *Engineer.*

Poultry, 17*th December*, 1836.

SCIENTIFIC NOTICE.

MACHINE FOR CUTTING WOOD INTO VERY THIN LEAVES FOR THE PURPOSE OF BRUSH-MAKING, TOY-MAKING, LITHOGRAPHY, &C.

A correspondent of the Society, M. Picot, has a brevet for a very ingenious machine, by means of which he obtains extremely thin leaves. From an inch of thickness, he obtains from 24 to 30 leaves fit for backing brushes, and 170 leaves for the purposes of lithography. We have seen and examined this machine, and it well merits the praises of practical men. The machine is very light, and it may be applied to indigenous and other woods, at an economy of one-half, if it is compared with the ordinary saw machines. There is no loss of wood, which is proved by the fact, that the inventor can work at the reduced price of 25 per cent. lower than ordinary machines. One man alone is sufficient to work it, he being at the same time the mover and conductor; and a boy, of from twelve to fifteen years of age, who gathers up the leaves as they fall upon the ground. The quickness of its operations is very great, for it is possible to cut 1000 leaves, fit for brush-making, in the space of an hour. In 1835, M. Picot has improved his machine so much, that, with one or two men, he can obtain leaves of sufficient dimensions for cabinet-making. These leaves are from 28 to 30 inches in length, and from 14 to 16 inches in breadth. With this second machine, two men, who serve as mover and regulator, can cut at least 100 leaves per hour, of dimensions large enough for cabinet-making.—*Recueil Industriel, Juillet,* 1836.

List of Patents

Sealed in Scotland since 25th October, 1836.

To Thomas Grahame, of Nantes, France, but now of St. James's-street, London, gentleman, for certain improvements in passing boats and other bodies from one level to another.—25th October.

— William Brindley, of Caroline-street, Birmingham, paper manufacturer, for improvements in the manufacture of tea-trays and other japanned ware, and in the board or material used therein, and for other purposes.—26th October.

— Michael Linning, clerk to his Majesty's signet in Scotland, for certain improvements in converting mosses into fuel, and in preparing and drying the said mosses; and for making and extracting certain colouring matter or paint, and tar, gas, oil, ammonia, varnish, and other properties from the same.—29th October.

To George Sullivan, of Morley's Hotel, Charing-cross, gentleman, in consequence of a communication made to him by a certain foreigner residing abroad, and invention by himself, of improvements in machinery for measuring fluids.—18th November.

— Robert Walter, Swinburne, of South Shields, Durham, agents, for certain improvements in the manufacture of plate glass.—18th November.

— Augustus Applegath, of Crayford, Kent, calico-printer, for certain improvements in printing calico and other fabrics.—18th November.

— John Yule, of Sanchiehall-street, Glasgow, practical engineer, for improvements in rotatory engines, or an improved rotatory engine.—18th November.

— Joseph Whitworth, of Manchester, engineer, for certain improvements in machinery, tools, or apparatus for turning, boring, planeing, and cutting metals and other materials.—24th November.

— William Watson, of Liverpool, merchant, communicated by parties residing abroad, for certain improvements in the manufacturing of sugars from beet-root and other substances.—3rd December.

— Robert Copland, of Courlands, Wandsworth-road, Surrey, engineer, for combinations of apparatus for gaining power.—5th December.

— Henry Huntley Mohun, of Walworth, Surrey, M.D., for improvements in the manufacturing of fuel.—5th December.

— William Sneath, of Ison Green, Nottinghamshire, lace-maker, for certain improvements in machinery, by aid of which improvements, thread-work ornaments of certain kinds can be formed in net or lace made by certain machinery, commonly called bobbin-net machinery, and on other fabrics.—9th December.

— Thomas Henry Russell, of Handsworth, near Birmingham, tube-maker, for improvements in making or manufacturing welded iron tubes.—9th December.

To John Buchanan, of Ramsbottom, Lancaster, millwright, for an improved apparatus for the purpose of dyeing and performing similar operations.—9th December.

— Luke Hebert, of Paternoster-row, London, civil engineer, for certain improvements in mills or machines for grinding and sifting farinaceous and other substances.—9th December.

— John Gordon Campbell, Glasgow, merchant, and John Gibson, of the same city, throwster, for a new or improved process or manufacture of silk, and silk in combination with certain other fibrous substances.—9th December.

— John Hanson, of Hinckley, Leicester, architect, for an improved vehicle for the conveyance of various kinds of loads upon common and other roads.—9th December.

— James Elnathan Smith, of Liverpool, merchant, communicated by a foreigner residing abroad, for certain improvements on railways and on locomotive carriage to work on such railways. —17th December.

— Daniel Chambers, of Carey-street, Lincoln's Inn, closet manufacturer, and Joseph Hall, plumber, of Margaret-street, Cavendish-square, for an improvement in pumps.—17th December.

— George Gwynne, of Holborn, London, and James Young, of Brick-lane, London, brewer, for improvements in the manufacture of sugars.—17th December.

New Patents
SEALED IN ENGLAND,
December, 1836.

To William Sneath, of Ison Green, in the county of Nottingham, lace-maker, for his invention of improvements in producing embroidery or ornaments on muslins, silks, and certain other fabrics.—Sealed 28th November—6 months for enrolment.

To Alexander Stocker, of Bordesley iron-works, and Henry Downing, of French Walls iron-works, both of Birmingham, in the county of Warwick, gentlemen, for their invention of improvements in manufacturing rivets, screws, blanks, and other articles.—Sealed 29th November—6 months for inrolment.

To David Nunes Carvalho, of Fleet-street, in the city of London, bookseller, for certain improvements in propelling or moving vessels and other floating bodies on water, and carriages on land, which improvements are applicable to windmills, and other purposes, being a communication from a foreigner residing abroad.—Sealed 3rd December—6 months for inrolment.

To Robert Armstrong, of Stonehouse, in the county of Devon, doctor of medicine, for his invention of certain improvements in the water-pressure engine, rendering it more generally applicable for raising water and other substances, and as a motive power.—Sealed 3rd October—6 months for inrolment.

To Moses Poole, of Lincoln's Inn, in the county of Middlesex, gentleman, for machinery for a method of generating power, applicable to various useful purposes, being a communication from a foreigner residing abroad.—Sealed 3rd December—6 months for inrolment.

To James Corbett, of Richmond-place, Limerick, Ireland, professor of music, for his invention of certain improvements in producing harmonic sounds on the harp.—Sealed 3rd December—6 months for inrolment.

To Jacob Perkins, of Fleet-street, in the city of London, engineer, for certain improvements in steam-engines, furnaces, and boilers, parts of which improvements are applicable to other purposes.—Sealed 3rd December—6 months for inrolment.

To George Sullivan, of Morley's Hotel, Charing-cross, in the county of Middlesex, gentleman, for improvements in machinery for measuring fluids, being a communication from a foreigner residing abroad.—Sealed 3rd December—6 months for inrolment.

To Henry Booth, of Liverpool, in the county of Lancaster, Esq., for his invention of certain improvements in the construction and arrangement of railway tunnels, to be worked by locomotive engines.—Sealed 3rd December—6 months for inrolment.

To Thomas Don, of James-street, Golden-square, in the county of Middlesex, gentleman, for his invention of certain improvements in preparing and drying grain, seeds, or berries, and for manufacturing them into their several products, which improvements are applicable to other useful purposes.—Sealed 3rd December—6 months for inrolment.

To William Bryant and Edward James, of Plymouth, in the county of Devon, merchants and co-partners, being of the people called Quakers, for their invention of improvements in the manufacture of liquid and paste blacking, by the introduction of India-rubber, oil, and other articles and things.—Sealed 3rd December—2 months for inrolment.

To William Hancock, of Windsor-place, City-road, in the county of Middlesex, gentleman, for his invention of certain improvements in bookbinding.—Sealed 7th December—6 months for inrolment.

To Henry Adcock, of Mount-pleasant, Liverpool, in the county of Lancaster, civil engineer, for his invention of certain improvements in the raising of water from mines and other deep places.—Sealed 9th December—6 months for inrolment.

To Frederic Burt Zincke, the younger, of Crawford-street, Marylebone, in the county of Middlesex, Esq., for his invention of the preparing or manufacturing of the leaf of a certain plant, so as to produce a fibrous substance not hitherto used in manufactures, and its application to various useful purposes.—Sealed 9th December—6 months for inrolment.

To Samuel Pratt, of Peckham Rye, in the county of Surrey, gentleman, for his invention of certain improvements in the construction of knapsacks, portmanteaus, bags, boxes, or cases for travellers.—Sealed 9th December—6 months for inrolment.

To Lemuel Wellman Wright, of Manchester, in the county of Lancaster, engineer, for his invention of certain improvements in machinery or apparatus for bleaching or cleansing linens, cottons, or other fabrics, goods, or other fibrous substances.—Sealed 9th December—6 months for inrolment.

To John Yates, of the parish of St. Ann, Limehouse, in the county of Middlesex, for his invention of certain improvements in tram-roads or railways, and in the wheels or other parts of carriages to be wheeled thereon.—Sealed 9th December—6 months for inrolment.

To George Marquis of Tweeddale, for his invention of an improved method of making tiles for draining, soles, house tiles, flat roofing tiles, and bricks.—Sealed 9th December—2 months for inrolment.

To John Melling, of Liverpool, in the county of Lancaster, engineer, for his invention of certain improvements in locomotive steam-engines, to be used upon railways or other roads, part or parts of which improvements are also applicable to stationary steam-engines, and to machinery in general.—Sealed 15th December—6 months for inrolment.

To Richard Thomas Beck, of the parish of Little Stonham, in the county of Suffolk, gentleman, for an invention of a new and improved apparatus or mechanism for obtaining power and motion to be used as a mechanical agent generally, which he intends to denominate "Rotæ

Vivæ," being a communication from a foreigner residing abroad.—Sealed 15th December—6 months for inrolment.

To William Sharpe, of the city of Glasgow, in North Britain, merchant, for a certain improvement in the treatment of cotton wool, in preparation for manufacturing the same into yarn and thread, being a communication from a foreigner residing abroad.—Sealed 15th December—6 months for inrolment.

To Robert Walter Swinburne, of South Shields, in the county of Durham, agent, for his invention of certain improvements in the manufacture of plate glass.—Sealed 15th December—6 months for inrolment.

To James Torry Hester, of Abingdon, in the county of Berks, surgeon, for his invention of an improvement in the constructing of chairs.—Sealed 15th December—6 months for inrolment.

To Thomas Routledge, and Elijah Galloway, of Water-lane, in the city of London, gentleman, for their invention of certain improvements in cabriolets and omnibusses.—Sealed 19th December—6 months for inrolment.

To Thomas Elliot Harrison, of Whitburn, in the county of Durham, engineer, for his invention of certain improvements in locomotive engines.—Sealed 21st December—6 months for inrolment.

To Andrew Smith, of Princes-street, in the parish of St. Martin-in-the-Fields, Westminster, in the county of Middlesex, engineer, for his invention of certain improvements in the construction of standing rigging, and stays for ships and vessels, and in the method of fitting or using it; and in the construction of chains applicable to various purposes, and in machinery or apparatus for making or manufacturing such rigging and chains.—Sealed 21st December—6 months for inrolment.

To John Crighton, of Manchester, for his invention of a certain improvement or improvements in the construction of cylinders used in carding-engines employed for carding cotton, wool, silk, and other fibrous materials.—Sealed 21st December—6 months for inrolment.

To James Potter, of Manchester, in the county of Lancaster, cotton spinner, for his invention of certain improvements in spinning machinery.—Sealed 21st December—6 months for inrolment.

To John Swindells, of Manchester, in the county palatine of Lancaster, manufacturing chemist, for his invention of certain improvements in the process of effecting the decomposition of muriate of soda or common salt —Sealed 21st December—6 months for inrolment.

To George Haughton, of High Holborn, in the county of Middlesex, glass merchant, for a certain improvement or certain improvements in the construction of lamps, being a communication from a foreigner residing abroad.—Sealed 21st December—6 months for inrolment.

To Stedman Gillett, of Guildford-street, gentleman, and John Chapman, of Paddington, mechanist, both in the county of Middlesex, for their invention of certain improvements in that description of vehicles called cabs.—Sealed 21st December—6 months for inrolment.

To William Gossage, of Stoke Prior, in the county of Worcester, chemist, for his invention of certain improved apparatus for decomposing common salt, and for condensing and making use of the gaseous product of such decomposition; also certain improvements in the mode of the conducting these processes.—Sealed 24th December—6 months for inrolment.

To Bennet Woodcroft, late of Ardwick, in the parish of Manchester, in the county of Lancaster, but now of Mumps, in the township of Oldham, in the same county, gentleman, for his invention of an improved mode of printing certain colours on calico and other fabrics.—Sealed 24th December—6 months for inrolment.

CELESTIAL PHENOMENA, FOR JANUARY, 1837.

D.	H.	M.	
1			Clock before the ☉ 3m. 57s.
—			☽ rises 1h. 16m. M.
—			☽ passes mer. 6h. 48m. M.
—			☽ sets 0h. 7m. A.
	11	10	☿ greatest Hel. Lat. S.
2	9	7	♄ in conj. with the ☽ diff. of dec. 3. 0. N.
4	5	23	♀ in conj. with the ☽ diff. of dec. 4. 16. N.
5			Clock before the ☉ 5m. 47s.
—			☽ rises 6h. 59m. M.
—			☽ passes mer. 10h 29m. M.
—			☽ sets 1h. 55 m. A.
	17	31	♃'s second sat. will im.
6	11	46	Ecliptic conj. or ● new moon.
	16		☽ in Perigee.
7	8	25	♃'s third sat. will im.
	9	30	♀ in conj. with the ☽ diff. of dec. 3. 7. N.
	14	20	♃'s first sat. will im.
9	8	49	♃'s first sat. will im.
	9	30	♅ in conj. with the ☽ diff. of dec. 4. 11. N.
10			Clock before the ☉ 7m. 56s.
—			☽ rises 10h. 36m. M.
—			☽ passes mer. 3h. 39m. A.
—			☽ sets 8h. 57m. A.
13			Occul. o Piscium im. 9h. 57m., em. 10h. 47m.
	5	12	☽ in □ or first quarter.
14	12	23	♃'s third sat. will im.
15			Clock before the ☉ 9m. 49s:
—			☽ rises 11h. 44m. M.
—			☽ passes mer. 7h. 28m. A.
—			☽ sets 2h. 14m. M.
16	9	25	♃'s second sat. will im.
—			Occul. A' Tauri, im. 4h. 51m. em. 5h. 45m.
17			Mercury R. A. 21h. 12m. dec. 16. 55. S.
—			Venus R. A. 17h. 48m. dec. 22. 32. S.
—			Mars R. A. 9h. 51m. dec. 17. 27. N.
—			Vesta R. A. 18h. 45m. dec. 22. 8. S.
—			Juno R. A. 13h. 56m. dec. 6. 54. S.
17			Pallas R. A. 22h. 4m. dec. 5. 9. S.
—			Ceres R. A. 23h. 51m. dec. 10. 28. S.
—			Jupiter R. A. 9h. 11m. dec. 17. 8. N.
—			Saturn R. A. 14h. 56m. dec. 14. 24. S.
—			Georg. R. A. 22h. 18m. dec. 11. 17. S.
—			☿ passes mer. 1h. 26m.
—			♀ passes mer. 22h. 3m.
—			♂ passes mer. 9h. 51m.
—			♃ passes mer. 13h. 22m.
			Occul. κ Tauri, im. 5h. 46m., em. 6h. 54m.
19	17	20	☿ greatest elong. 18. 37. E.
20			Occul. c. Geminorum, im. 9h. 3m. em. 10h. 24m.
—			Clock before the ☉ 11m. 25s.
—			☽ rises 2h. 42m. A.
—			☽ passes mer. 11h. 37m. A.
—			☽ sets 7h. 43m. M.
	10	40	☿ in the ascending node.
	12	0	☽ in Apogee.
21	7	45	Ecliptic oppo. or ○ full moon.
	16	21	♃'s third sat. will im.
	18	7	♃'s first sat. will im.
22	7	4	♃ in conj. with the ☽ diff. of dec. 4. 15. S.
23	1	1	♂ in conj. with the ☽ diff. of dec. 0. 26. S.
	12	2	♃'s second sat. will im.
	12	36	♃'s first sat. will im.
24	12	10	♃'s fourth sat. will im.
25	0	3	☿ in Perihelion.
	7	4	♃'s first sat. will im.
—			Clock before the ☉ 12m. 42s.
—			☽ rises 8h. 36m. A.
—			☽ passes mer. 2h. 40m. M.
—			☽ sets 9h. 39m. M.
	18	4	☿ stationary.
29	6	30	☽ in □ or last quarter.
	20	37	♄ in conj. with the ☽ diff. of dec. 3. 31. N.
30	14	30	♃'s first sat. will im.
		39	♃'s second sat. will im.

J. LEWTHWAITE, Rotherhithe.

METEOROLOGICAL JOURNAL,

FOR NOVEMBER AND DECEMBER, 1836.

1836.	Thermo.		Barometer.		Rain in inches.
	Hig.	Low.	High.	Low.	
Nov.					
26	43	30	29,37	29,28	,125
27	55	38	29,54	29,44	,175
28	57	51	29,33	29,23	,05
29	57	49	29,42	28,80	,4
30	48	42	29,62	29,42	,3
Dec.					
1	43	29	30,03	29,84	,3
2	52	35	29,97	29,75	,025
3	53	45	29,80	29,64	,05
4	56	48	29,78	29,73	,05
5	56	46	29,79	29,77	,075
6	55	41	29,88	29,77	
7	51	46	29,51	29,38	,075
8	45	38	29,23	29,10	,35
9	41	32	29,06	28,92	,075
10	42	28	29,35	29,11	
11	41	27	29,55	29,45	,05
12	50	22	29,55	29,31	,1
13	48	45	29,22	Stat.	,225
14	44	32	29,49	29,23	
15	40	32	29,91	29,75	,025
16	43	29	29,94	29,59	,15
17	47	28	30,01	29,98	
18	52	41	30,05	29,98	,025
19	50	41	30,06	30,04	,0125
20	45	38	30,17	30,09	
21	45	34	30,19	30,15	
22	48	36	30,25	30,06	
23	39	34	29,79	29,65	,1
24	35	26	29,74	29,60	
25	31	23	29,72	29,65	

Edmonton. **CHARLES HENRY ADAMS.**

Latitude 51° 37 32 N.
Longitude 3 51 West of Greenwich.

THE

London

JOURNAL AND REPERTORY

OF

Arts, Sciences, and Manufactures.

CONJOINED SERIES.

No. LIX.

Recent Patents.

To WILLIAM CHURCH, *of Heywood House, Bordesley Green, in the county of Warwick, gentleman, for his invention of certain improvements in apparatus to be employed in the conveyance of goods and passengers by land or water; part of which said improvements are also applicable to the ordinary purposes of steam-engines and other steam apparatus.* — [Sealed 16th March, 1835.]

THE subjects embraced under this patent, are to be considered rather as developments of the details of principles set out in several preceding patents granted to Dr. Church, than as altogether new inventions, now, for the first time, promulgated.

The present improvements take a wide range in the adaptation of steam as an impelling power, having principally for their objects the economy of fuel in generating steam, the economy of space occupied by the machinery, and of weight of material in its construction. They extend, also, to the arrangements of machinery suited to propelling vessels on water, and carriages on railways or on ordinary roads.

The subjects thus extending over so wide a field of operation, the specification is necessarily of unusual length: it is accompanied by numerous illustrative drawings, which we shall give as fully as our limits will permit.

The Patentee states, that his improvements consist in certain additions to, and variations from, the steam apparatus and machinery described in the specifications of the several patents which have been previously granted to me, bearing date respectively the 29th day of November, 1830; (see vol. viii., Second Series of the "London Journal of Arts," p. 1;) the 9th day of February, 1832, (see vol. ii., Conjoined Series, p. 89;) and the 7th day of September, 1833, (see vol. iv., Conjoined Series, p. 233;) which said specifications were duly inrolled in the Rolls Chapel of his Majesty's High Court of Chancery, according to provisos contained in the said grants: these improvements extending generally over the construction and arrangement of apparatus and machinery applicable to marine engines, locomotive engines, and to stationary engines, actuated by steam. The improvements which constitute the subject of the present patent may be described under the following heads:—

First, a peculiar construction and arrangement of the boilers, furnaces, condensers, and working parts of marine steam-engines; the objects to be attained in which construction and arrangement, are the economy of space, of weight of materials, and of consumption of fuel. Second, an improved method of producing condensation in any sort of condensing steam-engine, by the employment of distilled water for condensing the eduction steam; the water produced by condensation passing again into the boiler; and, by its purity, preventing deposit and incrustation of earthy matters upon the internal surface, which will greatly tend to preserve the boiler from being injured by the fire. Third, a peculiar construction and arrangement of the boiler and engines, suited to a carriage for locomotion on ordinary roads, or with slight variations, for railways. Fourth, an improved method of constructing the framework and the boiler for locomotive engines, combining great strength and lightness. Fifth, a mode of condensing the eduction steam of high-pressure engines, by the agency of atmospheric air. Sixth, a peculiar mode of connecting the locomotive engine with carriages to be impelled on ordinary roads. Seventh, improvements in the construction of wheels for locomotive carriages. Eighth, an improved method of lubricating the piston and pump rods of steam-engines. Ninth, a mode of extinguishing the fire in steam-engines, which is intended to operate as a safety valve. Tenth, additions to roads and railways, for the purpose of facilitating the ascent of locomotive carriages up inclined planes.

The peculiar construction and arrangement of boilers, furnaces, and the working parts of marine engines, proposed as the first head of these inventions, are designed to take up as small a space as possible in the vessel, yet afford sufficient room for all the parts, in proportion to the required power of the engine. They also combine lightness with strength, and a great extent of heating surface in the boiler. The drawings exhibit several views of a pair of marine engines, with their boilers, furnaces, and condensers, showing the arrangements and construction of the several parts. The boilers may constitute the framework of the engine, the outer plate being of extraordinary thickness, and united in a peculiar manner; or the framework may surround the boiler in the way hereafter explained.

In Plate XII., fig. 1, is a front elevation of the engine, showing a cross-section of the timbers of a steam vessel; fig. 2, is a plan, or horizontal view, and fig. 3, a side elevation of the same; fig. 4, is a vertical section, taken longitudinally through the boilers, furnaces, flues, and condensers; and fig. 5, is a vertical section of the same, taken through the boiler, furnace, and flues, at the dotted line a, b, in fig. 4. Fig. 6, is another similar section, taken at the dotted line c, d, in the same figure.

Fig. 7, is a horizontal section, taken through the condenser and refrigerator of one engine, and through the furnace of the other, in the direction of the lines e, f, in fig. 6: A, is the furnace or fire-place; B, the ash-pit; C, C, the various water chambers of the boilers; D, the bridge of the furnace; E, the flues, leading to the system of the tubular flues, F; passing through the main water chambers, and opening into the chimney G; H, H, are the steam chambers. It will be perceived that each engine has two boilers, and each boiler a separate steam chamber, connected together by the steam pipes I, I, from which the induction steam pipes descend to the valve boxes; also that each boiler has a separate furnace, and flues opening into the chimney. The cylinders of the engines are at K, K, receiving their supply of steam from the valve boxes L, L: M, are the eduction steam passages, leading down the front of the boiler into the refrigerating pipes N, N, N, which are divided into two portions; the steam passing in one direction through the upper portion, and in the reverse direction in the lower portion, and off by the passage O, to the condenser P, P, where it meets with a jet of cold distilled water, as described hereafter: Q, is the air pump:

R, the refrigerating chamber for cooling the distilled water. The piston rods S, S, are connected by the cross heads T, T, to the rods U, U, jointed to the bell-crank levers V, V, mounted upon a strong cross shaft turning in bearings attached to the boiler. These bell-crank levers are connected by the rod and cross heads W, W, to the crank X, mounted in the usual manner upon the paddle-wheel shaft Y, turning in bearings attached to the boiler: Z, is the stoker's room.

The air supplied to the furnaces to support combustion passing through the apertures *a, a, a,* in the outer casing of the refrigerating chambers, and circulating amongst the steam-pipes N, N, becomes heated, at the same time lowering the temperature of the eduction steam. The air proceeds thence, through the opening *b, b,* into the ash-pit under the fire-bars *c, c,* the ash-pit being closed by the doors *d, d.* By these means a considerable portion of the heat is returned to the boilers which would otherwise be lost.

It is to be observed, that though I have, in this arrangement, found it most convenient to place the air-refrigerating tubes in horizontal ranges, yet I do not intend to confine myself to that position, as in some cases I adapt them to engines in vertical positions; and I do not intend to confine myself to any particular form of tubes or passages for conducting the eduction steam, but pass it in any convenient way that will expose the greatest extent of surface for transmitting the heat to a passing current of air. The other door *e, e,* is for stoking the fire; and *f, f,* is the situation of the fresh fuel, which becomes partly ignited upon the small inclined bars, whence it descends into the furnace A, on to the main fire bars. The smoke and vapour arising from the ignition of coal on the inclined bars at *f,* passes down into the furnace, and becomes consumed in its passage through and over the ignited fuel. Doors *g*, *g*, at the back of the ash-pit, allow of the flues being also cleaned when required, and *h*, *h*, are doors underneath, and *i*, *i*, doors above the tubular flues to allow of their being also cleaned when required.

The piston of the air pump Q, is worked in the following manner: *k*, *k*, are rods connected to the bell-crank levers V, and to the end of the levers *l*, *l*, turning upon pins as their fulcrums, firmly secured on to the sides of the boiler. The other ends of the levers *l*, *l*, are connected by links *m*, *m*, to the cross heads *n*, *n*, to which the piston rod of the air pump is attached, and they are guided by their up-and-down motion by the anti-friction rollers on their ends, running between the parallel guides *o*, *o*, fixed upon the bars placed across the cold water cistern *p*, *p*, in which the condensers, air pumps, and refrigerators, are placed. The pumps for supplying the boilers with water may be situate so as to be worked by the cross head *n*, *n*, or in any other convenient situation, taking their supply from the hot-water wells of the air pump Q.

The piston rods of the engines are guided by the parallel motion *q*, *q*, connected to the cross head; and the steam valves of the engine may be worked in any convenient manner. I have shown them worked by an excentric *u*, placed upon the paddle-wheel shaft, and communicating motion through the rod *v*, to the weigh shaft *w*.

The passage *y*, is for the flow of the distilled water from the condenser into the hot-water well of the air pump; and *z*, is the pipe by which it passes from the pump to the air-tight chamber of the refrigerator, whence it rises up the jet pipe placed in the condenser. It will of course be understood, that the engine, boilers, condensers, and various parts, must be firmly secured in the proper place by connexions with the timbers of the vessel; but it is not necessary to show them in the drawings, as they must be varied to suit different vessels, and form no part of this improvement: alſo, that all the parts of the engine and steam-chamber pipes and flues above the deck must be housed in; which would also be varied to suit the taste of the builder; taking care to have doors placed where it is necessary, in order to get at the machinery with convenience for cleaning and lubricating.

It will be perceived that in the arrangements and construction of the various parts of the marine engine above described, the whole of the parts of the engine, with its shafts and bearings, are placed upon the boiler, which, as before stated, forms the framework upon which the engine is built, but it may be desirable to construct the boiler and furnace independently of the engine; in which case I should prefer the same arrangement of the various parts, but place the cylinders, shafts, and bearings upon strong iron framework at the side and ends of the boiler; the foundation of the engine cylinder being upon strong cross plates or bars, as also the bearings of the crank or paddle-wheel shaft, in the manner shown at fig. 8.

Figs. 9, and 10, are diagrams intended to illustrate the manner of carrying into effect my improvements in condensing, as applied to marine engines, which constitutes the second head of my invention. Fig. 9, is a longitudinal section, taken vertically through the condenser, air-pump, and refrigerator. Fig. 10, is a plan, or horizontal view of the same. The eduction steam passes from the engine by the pipe *a*, into the condensing chamber *b*, where it meets with a forced jet of cold distilled water coming from the rose head of the pipe *c*, and thereby becomes condensed in the ordinary way. The water produced by condensation passes from this chamber, together with any air or vapour, along the passage *d*, into the hot-water well *e*, of the air-pump *f*, its piston or bucket *g*, being worked in any convenient manner by the engine. As the bucket of the pump rises, it lifts the hot water from the well, and ejects the air out of the pump, through the aperture *h*, at the top; the water raised by the pump is forced through the pipe *i*, into the air-vessel *k*, where it is retained by the valve *l*, under the elastic pressure of the compressed air within the chamber.

In order that the air raised by the pump may be separated from the water, and not allowed to pass into the air-vessel *k*, the following contrivance is used: *m*, is a float of any light construction, which rises with the water lifted by the bucket. This float is connected by a link to the short lever *n*, having its fulcrum on the inside of the pump; and to this lever is attached the rod of the air-valve *o*, which, as the float rises, closes the aperture *k*, air-tight, before the bucket has finished its up stroke.

The portion of air remaining in the pump, therefore, above the float, becomes compressed by the continued action of the piston, until its elastic pressure within the pump overcomes the elastic force of the confined volume of air in the chamber *k*, when the valve *l*, immediately opens, and the water is forced into the chamber *k*. From the chamber *k*, the distilled water passes down the series of refrigerating pipes *p*, *p*, *p*, or other conveniently formed channels, into the lower chamber *q*, and from thence into the jet pipe *c*, before-mentioned; the water being under elastic pressure, until it escapes in a spray or jet at the rose head.

The refrigerating tubes are surrounded by a bath, or continuous stream of cold water, supplied to the refrigerating chamber by means of a pump, or otherwise through the pipe *r*; and this water makes its exit from the chamber through the pipe *s*. By these means the distilled water, passing from the chamber *k*, down the tubes *p*, becomes sufficiently reduced in temperature to be used for the cold water jet in the condenser; the force of the jet being regulated by the pressure in the chamber *k*, and by the opening of the cock placed at *t*. The downward stroke of the piston allows the air in the pump again to expand, when the valve *l*, will close, retaining the water in the chamber *k*, and also the foot valve of the channel *d*, will be closed, and remain so until the next up stroke of the piston.

I would here remark, that though I have shown and described the chamber *k*, as a clôse air vessel, yet that is not absolutely necessary, as the apparatus would work, though not with such good effect, if the top of the vessel *k* were open.

(To be continued.)

The extreme length of this specification, and the numerous drawings which accompany it, compel us to postpone the remainder of the subject until our next. We have, however, in the above, set out that part of the specification which we consider to be the successful close of a series of experiments described under several of Dr. Church's former patents for transmitting the heat from the eduction steam under condensation, and returning that heat to the boiler; and also for supplying the boiler with pure distilled water, the product of such condensation.

We abstained from any remarks at the close of our report of the patent of 1833 (which more particularly set out this part of the Doctor's invention), because we were then aware that his improvements were leading to other developments of the subject; and have now the satisfaction of saying, that in our opinion, the present adaptation of those principles has carried the improvements of the steam-engine farther than all the other inventions relating to that important engine since the days of Watt.

It has ever been a desideratum to obtain pure water for supplying the boilers of steam-engines, and for this purpose many attempts have been made to condense the eduction steam, by bringing it in contact with cooling surfaces. These attempts have, however, we believe, all proved abortive, until the system of operation proposed by Dr. Church, in his last specification, became adopted.

That system succeeded to a considerable extent, but still there were inconveniences attending it, viz. the condensation was not effected with sufficient rapidity, and consequently in a less perfect manner, than by the old plan of injection. Hence, in order to keep up the mercury in the barometrical gauge, a larger air pump became necessary. It was also found that, whenever sudden condensations of the steam took place, within small vessels or confined chambers, that they were attended with violent concussions, producing tremulous motions of the vessels, which being necessarily slight, not only caused leakage, but also considerable derangement.

The apparatus and means we have now described, as the subject of the Doctor's last improvements in condensing, completely avoid those inconveniences as in connexion with the other improvements, the steam is there condensed by a jet of water as formerly; therefore, the operation will be effected with the same suddenness, and as perfect a degree of condensation obtained without exposing the tubes to the injurious consequences of concussion.—Ed.

To EDWARD JONES, *of Birmingham, in the county of Warwick, builder and brick-maker, for his invention of certain improvements in machinery for moulding bricks, tiles, and other articles made of brick-earth.*—[Sealed 10th August, 1835.]

THESE improvements are described under four distinct heads: the first applies to a machine for moulding the earth into bricks in a circular frame plate, horizontally, containing a series of moulds or rectangular boxes, standing radially round the circumference of the circular frame, into which boxes successively the clay is expressed from a stationary hopper as the frame revolves, and after being so formed, the bricks are successively pushed out of their boxes, each by a piston, acted upon by an inclined plain below. The second head of the specification describes a rectangular horizontal frame, having a series of moulding boxes placed in a straight range, which are acted upon for passing the clay by a corresponding range of pistons fixed in a horizontal frame, worked up and down by rods extending from a rotary crank shaft, the moulding boxes being allowed to rise for the purpose of enabling the pistons to force out the bricks when moulded, and leave them upon the bed or board below. The third head applies particularly to the making of tiles for the flooring of kilns in which malt or grain is to be dried. There is in this contrivance a rectangular mould, with pointed pieces standing up for the purpose of producing air-holes through the tiles as they are moulded, which is done by pressing the clay into the moulds upon the points, and scraping off the superfluous matter at top by hand. The fourth or last head applies to moulding chimney pots in double moulds, which take to pieces for the purpose of withdrawing the pot when the edges of the slabs or sides are sufficiently brought into contact.

The drawing which accompanies the specification very imperfectly represents some parts of the apparatus, and the description is still more defective; but as we are acquainted with the machinery, we will endeavour to give it in an intelligible form, and quote those parts of the specification which point out the particular features of novelty proposed to be claimed by the Patentee as his invention under the several heads.

Plate XIII., fig. 1, represents in elevation the first-mentioned machine for moulding bricks. The moulds are formed in the face of a circular plate or wheel *a, a*, a portion of the upper surface of which is represented in the horizontal view, fig. 2. Any convenient number of these moulds are set radially in the wheel, which is mounted upon a central pivot supported by the masonry *b, b*. There is a rim of teeth round the outer edge of the wheel *a, a*, which take into a pinion *c*, on a shaft connected to the first mover; and by these means the wheel *a*, with the moulding boxes, is made to revolve horizontally, guided by arms with anti-friction rollers, which run round a horizontal plate *d, d*, fixed upon the masonry.

A hopper *e*, filled with the brick-earth shown with one of the moulding boxes in section, is fixed above the face of the wheel in such a way, that the earth may descend from the hopper into the several moulding boxes as the wheel passes round under it; the earth being pressed into the moulds, and its surface scraped off smooth by a conical roller *f*, in the bottom of the hopper.

Through the bottom of each moulding box there is a hole for the passage of a piston rod *g*, the upper end of which rod carries a piston with a wooden pallet upon it, acting within the moulding box; and the lower end of this rod has a small anti-friction roller, which, as the wheel *a*, revolves, runs round upon the face of an oblique ring or inclined way *h*, *h*, fixed upon the masonry.

The clay is introduced into the moulding boxes from the hopper, fixed over the lowest part of the inclined way *h*; and it will be perceived that as the wheel revolves, the piston rods *g*, in passing up the inclined way, will cause the pistons to force the new-moulded bricks, with their pallet or board under them, severally up through the mould, into the situation shown at *i*, in fig. 1, from whence they are to be removed by hand. Fresh pallets being then placed upon the several pistons, they, with the moulds, will be ready for moulding fresh bricks, when, by the rotation of the wheel *a*, they are severally brought under the hopper, the pistons having sunk to the bottoms of their boxes, as the piston rods passed down the other side of the inclined way *h*.

The Patentee says, after having described the first head of his invention, he " would have it understood that the same may be varied without departing from the main object of the invention; viz. that of arranging a series of moulds when worked by means of an inclined track, and in such manner, that bricks, tiles, or other articles, made of brick-earth, may be capable of being formed in a mould with pallets or boards laid within the moulds, and constituting the bottoms thereof: the brick being removed from out of the moulds, with the pallets or boards under them, as above described. I do not, therefore, confine myself to the precise arrangement of the machine here shown, though it is the best with which I am acquainted for the purpose."

The second head of the invention is another construction of apparatus for moulding bricks, in this instance, in a rectangular frame. Fig. 3, is a front elevation of the machine; fig. 4, a section of the same taken transversely, *a*, *a*, is the standard framework and bed on which the bricks are to be moulded. Near the corners of this standard framework, four vertical pillars *b*, *b*, are erected, upon which pillars the frame of the moulding boxes *c*, slides up and down, and also the bar *d*, carrying the rods of the pistons *e*, *e*, *e*. These pistons are for the purpose of compressing the clay in the moulding-box, and therefore must stand exactly over and correspond with the respective moulds in the frame *c*, beneath.

The sliding frame *c*, constituting the sides and ends of the moulding boxes, is supported at each end by an upright sliding rod *f*, which rods pass through guides fixed to the sides of the standard frame *a*, *a*; and at the lower end of each there is a roller, bearing upon the levers *g*, on each side of the machine, but seen only in fig. 4: which levers, when depressed, allow the moulding-boxes to descend, and rest upon the bed or table of the machine *h*, *h*.

In this position of the machine resting upon the bed or table, the brick-earth is to be placed upon, and spread over the top of the frame *c*, by the hands of workmen, when the descent of the plunger or pistons *e*, *e*, *e*, will cause the earth to be forced into the moulds and the bricks to be formed therein. To effect this, rotary power is to be applied to the toothed wheel *i*, fixed on the end of the main driving crank shaft *k*, *k*, which, on revolving, will, by means of the crank rods *l*, *l*, bring down the bar *d*, with the pistons or plungers *e*, *e*, *e*, and compress the earth compactly into the moulds, and thereby form the bricks.

When this has been done, the bricks are to be released from the moulds by the moulding frame *c*, rising up from the bed, as shown in fig. 3, the pistons still remaining depressed, and bearing upon the upper surfaces of the bricks. The moulding frame is raised by means of cams *m*, upon the crank shaft, which, at this part of the operation, are brought under the levers *g*, for the purpose of raising the cams and the sliding rods *f*, into the position shown at fig. 4.

The bricks having been thus formed and released from their moulds, they are to be removed from the bed of the machine by pushing forward, on the front side, fresh boards or pallets, which, of course, will drive the bricks out on the other side, from whence they are to be removed by hand.

There is to be a small hole in the centre of each pallet, and also in the bed, for the purpose of allowing any superfluous earth to be pressed through from the moulding boxes when the pistons descend. And in order to cut off the projecting piece of clay which would be thus formed on the bottom of the brick, a knife-edge is in some way connected to the bed of the machine; and as the brick slides over it, the knife separates the protuberant lump: but the particular construction of this part of the apparatus is considered to be of little importance, and the manner of effecting the object is not clearly set out in the specification.

The Patentee proposes a variation in this construction, which he describes in these words: "It will be evident that in place of having the moulds to rise, they may, by suitable arrangements, be made to descend below the bricks. In this case, in place of the boards, stationary blocks to receive the pallets must be fixed on the bed of the machine, and these blocks must be shaped in such manner as to allow of the moulds passing over them; and then it will be desirable to use the first part of my improvements, that of having the pallets within the moulds at the time of moulding the bricks; or in case of working with exceedingly stiff brick-earth, the pallets may be dispensed with."

The claim of novelty, as regards this second head, is thus expressed by the Patentee: "I would have it understood, that what I claim as this second part of my invention, is the arrangement of a mould, or series of moulds, for making bricks or tiles, and other articles, as above described, whereby the bricks, or other articles aforesaid, are held down by the piston or pistons during the time that the moulds are passing off, or being raised up, for the purpose of delivering the bricks or tiles therefrom: the pallets on which such bricks or tiles are made remaining stationary, as long as the operation of moulding is being performed.

"And I also claim the moulding of bricks, tiles, and other articles, in such manner, that they are moulded on and carried away by the same pallets or boards, which lie at the bottom of, or under, the moulds, as described: and I also claim the making of a hole through the pallet or piston, or any suitable part of the mould by which the superfluous brick-earth can escape, leaving the brick or tile of the proper thickness; and also the descending of the moulds, leaving the bricks or tiles on the pallets, or on the blocks, as above described."

From the foregoing description, it will be evident that other articles than bricks or tiles may be formed, such for instance as the sides for fire-places, provided the moulds be suitably formed for that purpose.

The third construction of apparatus, which is for the manufacture of kiln tiles, is shown in vertical section at fig. 5. It consists of a rectangular box *a, a*, of the dimensions of the intended tile, which is to be moulded by pressing clay into the box at the top, by hand, and then scraping off the superfluous clay smooth, to form the face of the tile. This box is made capable of sliding up and down on stationary pillars *b, b* : in the interior of the box, any desired number of upright blocks *c, c, c, c*, are fixed, which are for the purpose of producing holes or recesses in the tile when moulding.

On the top of the pillars *b, b*, a flat plate *d, d*, is fixed, which has holes for the blocks *c*, to pass through, and a pallet or board is laid upon this plate for the tile to be formed upon.

The moulding box *a, a*, is supported by a jointed rod *e*, and lever *f*, which, when raised up by its handle, and fixed by its catch, as shown in the figure, renders the apparatus ready for work.

The clay being now introduced and pressed down in the box *a, a*, and scraped off level at top, the blocks *c, c, c*, standing up, cause so many holes or recesses to be formed in the tile as it is moulded. The solid parts of these blocks do not reach quite to the top of the mould, but small points standing up from them do; the effects of which is, that the blocks produce large holes or recesses, which extend nearly through the tile, and the points continuing to the top of the mould protrude quite through the tile, forming, as a continuation of the large apertures, such small vent holes as are sufficient to allow the air only to pass when the tile is applied to the construction of a kiln floor.

The tile having been thus moulded, the lever *f*, is let fall, which causes the box *a*, *a*, and also the blocks *c*, *c*, *c*, to descend from the stationary plate *d*, leaving the tile free, and resting upon the pallet and plate, from whence it is to be removed to the drying room: the appearance of the upper face of the tile with its small holes being that shown at fig. 6.

The Patentee says, that he would have it understood that there may be a series of such descending moulds combined into one machine, in place of only using one mould; and he further says, "I claim the combination of the mould *a*, with a fixed or stationary plate *d*, together with the uprights (blocks *c*,) with points, such mould being capable of being withdrawn from the tile, or other article formed therein, by descending therefrom, leaving the tile on the pallet."

The manufacturing of chimney pots, which constitutes the last head of the invention, consists in the employment of a rectangular box as a mould, the interior of which is to give the external form of the pot; and its internal form is to be produced by a rectangular block acting as a piston, which being introduced into the former, presses the clay up to the interior of the receiving box or mould, and so gives to the clay the desired figure. The particular feature of novelty in this, is the manner of constructing the external box or mould, which is made to open for the purpose of discharging the chimney pot when moulded; its sides are therefore joined together, and when combined, are held fast by hoops.

Fig. 7, shows one of these chimney pot moulds in vertical section; *a*, *a*, being its sides, which are fitted at their edges to each other, and to the bottom by rebates or grooved ledges, and when combined, are braced together by external hoops; *b*, *b*, is the plunger, introduced to compress the clay, and by forcing it outwards, to mould it to the shape of the box *a*, *a*.

The earth is to be placed in the mould box *a*, in the form of four slabs; and when the plunger *b*, is introduced, its pressure will equalise the thickness of the clay, and cause it to blend and unite at its edges, the superfluous matter oozing through holes made in the plunger. The piston being then removed, and the sides of the outer box separated, the chimney pot is readily removed to be dried.

The Patentee says, "What I claim in this part of my invention, is the removal of one or more sides of the mould, leaving the chimney pot, brick, tile, or other article, moulded therein, ready to be removed; and this description of mould, that is to say, a mould having the property of permitting the sliding away of a side or sides thereof, will be found necessary in any moulded-sided brick or chimney jambs.

"In conclusion, I would remark that in all the machines herein described, it will be necessary, from time to time, to scrape and wash the moulds and sand them, as is the case in brick-making by hand; and I would wish it to be understood, that I do not claim any of the parts separately or combined, as herein described, otherwise than as therein pointed out, and distinctly claimed as my invention or improvement.—[*Inrolled in the Inrolment Office, February*, 1836.]

To Joseph Bunnett, *of Newington Causeway, in the borough of Southwark, and county of Surrey, window-blind maker, for his invention of certain improvements in window shutters; which improvements may also be applied to other useful purposes.*—[Sealed 18th June, 1836.]

The window shutters constructed by the Patentee are formed by series of long narrow plates, or strips of sheet iron, placed horizontally, like Venetian blinds, as shown in Plate XIII., fig. 8, at A. The strips are connected together one above another by hinges, not seen on the outside, and slightly overlap at the edges, as shown at *a, a, a,* in the enlarged sectional representation, or side view of a portion of the shutter at fig. 9.

This construction is not new, as respects shutters; but the mode of connecting the strips by hinges of a peculiar kind, constitutes the first feature of the invention. The particular mode of raising and lowering these shutters in their window frames, as proposed by the Patentee, forms the second feature; and the means of fastening and unfastening the shutters is the third.

Fig. 10, represents a piece of plate iron or other metal, stamped out by a press to that particular shape for the formation of the butts and nuckles of one of the hinge pieces. This plate is to be doubled back at the dotted lines, so as to produce the loops for the hinge joints; and when properly put together with pins in the nuckles, and attached to the backs of the strips of iron, will appear as at *b, b, b,* fig. 9.

Nothing more need be said of this hinge, as its construction will be obvious; but we will add the words of the Patentee, illustrative of his claim to novelty in reference to this first feature of the invention: he says, he "claims the application of such construction of hinges *in combination with the absence of cutting away* the edges of the plates or strips." He also stated that he disclaims the construction of the shutters themselves, as long known and in use prior to his patent.

The mode of connecting these shutters to the window frame, and of winding them up, is shown in the side view or transverse section at fig. 11: *a, a, a,* are the series of long strips of plate iron connected by the hinges as described;

c, is a roller mounted on pivots in the upper part of the window frame, round which the strips constituting the shutter are lapped by the rotation of the roller. At the end of the roller, a toothed wheel is affixed, which takes into a worm or endless screw at the top of the vertical shaft *d*. The lower end of this shaft has a bevel wheel, taking into a pinion at the end of the horizontal shaft *e*; and hence, by means of a winch applied to the reverse end of this shaft, as at *f*, such rotary motion is given to the vertical shaft *d*, and to the roller *c*, as will cause the jointed shutter to be drawn up or down, guided by grooves in the side frames of the window. The Patentee says, it is the application of the endless screw and toothed wheel* *to this description of shutter* that he claims, as the second feature of his improvement.

In order to confine the shutter when let down, a spring bolt *o*, shoots forward, and its end passes over or into a straight bar at the bottom of the shutter. This bolt is connected to a spring lever, and the act of putting the winch *f*, on to the end of the shaft *e*, causes the spring lever to be forced aside, and thereby to withdraw the bolt *g*, and allow the shutter to be wound up. This mode of releasing the bolt, by means of the key or winch *f*, constitutes the third feature of improvement claimed.—[*Inrolled in the Inrolment Office, December*, 1836.]

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* A mode very nearly resembling this, of raising and lowering plate-iron shutters, is described in the specification of Kitchen and Smith's patent, dated 7th February, 1829. (See vol. v. of the Second Series of the "London Journal of Arts," p. 26.)

To Jonas Bateman, *of Islington, in the county of Middlesex, cooper, for his invention of an apparatus or instrument for saving human life, or other purposes, in cases of shipwreck, or other disasters by water.*—[Sealed 30th June, 1834.]

This is a very singular, and, in our opinion, a very absurd apparatus to be made the subject of a patent. It is a sort of box intended to act as a buoy to float in the water, to which persons are to cling in order to save them from drowning.

The invention consists in the construction of a *frame* of light wood six feet six inches long, by two feet six inches wide, and seven inches deep, tapering from the top six inches each way, so as to make it float in one position only, that is, the broad part upwards. The framing is to be divided by partitions longitudinally and transversely, and the spaces filled with cork or other light material, which is to be boarded up all round, and bound by strips of hoop iron.

There is no drawing representing the apparatus, but its form and construction is very obvious, as every minutiæ is stated, and is very carefully described, from the number of hoops, the number of nail holes in each side, their distance apart, and the exact dimensions of the holes, which we do not think it necessary to recite. Stout metal rings are to be attached, and if it should be thought necessary, a mode of guiding it in the water may be added by means of rowlocks or other convenient means, in order that the persons hanging to it may use oars; and rope loops may be attached, for the persons to sit or stand in, and bags of cork may be added, for the further support of the persons.

A variety of other buoyant matters may be also attached to it; and it is calculated that the apparatus will be sufficient to support six persons, and preserve them from drowning.

In the close of the specification, the Patentee says, "the method of putting the apparatus in use, will, of course, depend upon the circumstances under which the necessity arises for having recourse to its assistance, but which will readily suggest itself."

The Patentee does not claim any of the articles separately, but he claims their combination as described, for the purposes intended to be answered thereby.—[*Inrolled in the Inrolment Office, December*, 1834.]

To MOSES POOLE, *of Lincoln's Inn, in the county of Middlesex, gentleman, for improvements in the description of public vehicles called* "CABS," *being a communication from a foreigner residing abroad.*—[Sealed 21st September, 1836.]

THE invention is stated to relate to that description of public vehicles called cabs, and to consist in the application of improved constructions of certain two-wheeled vehicles, the entrance or doorway for the passengers being behind. Two different forms are proposed, but as we do not understand in what particular feature the novelty consists, we shall give the specification *verbatim*, as the subject appears to be likely to come under legal consideration.

Plate XIV., fig. 1, represents a side view; fig. 2, a back view; fig. 3, a longitudinal section; and fig. 4, a transverse section of the vehicle, or two-wheeled carriage, constructed according to the plan of the inventor. In each of these the same letters of reference indicate similar parts.

The nature of the main framing of the body of the carriage will be readily understood by examining the sections, figs. 3, and 4, where such framings are clearly shown, there being no internal lining: *a, a,* is an ordinary cranked axle, which is preferred in consequence of its bringing the carriage or body of the vehicle nearer to the ground; *b, b,* are the wheels; *c, c,* elliptical springs, on which the body of the vehicle is mounted: these springs, as shown in the drawing, are made according to an invention for which a patent was taken by Mr. Boulnois, dated the 30th January, 1836. (See our present No. p. 284.) But although these springs are recommended in consequence of the easy motion which is obtained thereby to the body of the vehicle, other springs may be employed; *d, d,* are the shafts which are connected with the body of the vehicle by pin joints, as is clearly shown at *e*, and each shaft passes through a socket *f*, which is supported by the projecting bracket *g*, there being sufficient space in the sockets *f*, to allow of movement therein of the shafts up and down; and *h, h,* are springs affixed to each of the shafts, one at top and the other below, which being within the socket *f*, and having a tendency to spring from the shafts, by this means the weight on the horse is relieved, the ordinary motion of the shafts acting on the body is avoided, rendering the vehicle as easy as when on four wheels; *i, i,* are the steps for the driver to mount to the driving box *j*, the construction of which will be evident on examining the drawing; *k, k,* are the hooks to which the braces are attached. The shape of the body of the vehicle is clearly shown in the several figures; but it should be remarked that the same may, in some degree, be varied, provided the entrance for the passengers behind be retained; *l*, is the step for the passengers to enter; *m, m*, are folding doors, which are made in two parts, in order to facilitate the entry of passengers from which ever side of the road the carriage may be drawn up to, though the same may have only a single door, if desired; *n, n*, are two windows or glazed openings in front of the vehicle; these windows are shown to be fixtures, but they may be made to open like the windows of carriages in general, and as is well understood by coach and carriage builders; *o, o*, are two ventilators, being two flat narrow boards, capable of closing the opening at *o, o*, but moving on axes, they may be set open to any degree desired by the passengers; *p, p*, are two windows of glass at the back, which are shown fixed in the drawings, but they may be made to open if desired; *q, q*, are two seats for the passengers, who sit opposite or facing each other, with their sides to the horse, which will be easily understood on examining the drawing, particularly at figs. 3, and 4, where, as before stated, the carriage is shown in section, in order to explain the nature of the main framing. The interior may, however, be lined according to the taste of the builder.

By this arrangement of the carriage, it will be evident that great safety will be obtained, together with an elegant close carriage or vehicle of a very light construction, which will be drawn with facility by a single horse. The vehicles shown in the drawings are expressly constructed for two passengers, and to be used for that description of public vehicles called cabs, which, according to the present construction, are justly considered very dangerous vehicles, owing to the liability of persons riding therein to be thrown out should the horse fall, or the wheels come against any other carriage. But according to the construction of the above description of carriage, the passengers, in the event of like accidents, or in the event of a horse running away, may, with facility, get out of the vehicle by merely unbolting the door on the inside and stepping out, taking care, however, when the horse is running away, to hold on and run behind for a short distance, to prevent falling.

I will now proceed to describe the second vehicle, differing from that above described in some particulars, but having the same common properties and advantages of the door or entrance for the passengers behind. In the present case, however, the passengers sit with their faces to the horse, and side by side of each other. Fig. 5, shows a side view; fig. 6, a back view; and fig. 7, a longitudinal section of a vehicle constructed according to the second part of the invention. In each of these figures the same letters of reference indicate similar parts; and it will only be desirable further to add, in respect to this second carriage or vehicle, that the seats are placed one on each side of the doorway or entrance, each seat being suitable for one person; and there may, if desired, be a folding seat to lie across the doorway when the door is shut, and thus making room for three persons, as is shown by dotted lines in fig. 6. The front part of this vehicle may be more or less open, according to the taste of the builder, and may either have windows or folding blinds; and where the door is made in one part, as is shown in fig. 6, a blind or shutter may be slided, formed within the door, and capable of sliding up, and closing the openings in like manner to the blinds to doors of ordinary carriages, which is well understood.

It should be remembered, that in various constructions of carriages and vehicles, the entrance for the passengers has been from behind, that property, therefore, is not claimed generally, but when combined in carriages such as are above described. And I would have it understood that no claim is made to any of the parts separately, nor is the invention confined to the precise arrangement here shown, so far as the shape or figure of the body of the carriage is concerned; but what is claimed as the invention under the present letters patent, is, first, the construction of a two-wheeled two passenger one-horse vehicle, such as is shown in figs. 1, 2, 3, and 4, of the drawings, wherein there are seats for two passengers, one opposite the other, with the doorway or entrance behind, when the same is applied to that description of public vehicles called cabs. Secondly, the construction of a two-wheeled two or three passenger one-horse vehicle, such as is shown at figs. 5, 6, and 7, of the drawings, wherein there are two seats, one on each side of the doorway or entrance for passengers to sit with their faces towards the horse, combined with a door or entrance behind, when the same is applied to that description of public vehicles called "cabs."—[*Inrolled in the Inrolment Office, January,* 1837.]

To William Coles, *of Charing Cross, in the county of Middlesex, Esq., for his invention of a certain specific or remedy for the cure, alleviation, or prevention of rheumatic gout, or other affections, arising from colds or other causes.*—[Sealed 26th July, 1834.]

The advantages of aromatic effluvias administered to the human body in the form of vapour baths, has long been considered beneficial for the relief of rheumatic and gouty affections; it is now proposed to apply aromatic gums, herbs, and some descriptions of minerals, to the affected parts, enclosed in linen or other porous bandages.

The Patentee describes his invention as consisting in mixing and applying certain herbal, botanical, mineral, and other medicinal substances, enclosed between two pieces of linen, cotton, or other such material, sewn up and divided in the way called quilting, into compartments or flat bags; the linen or cotton being formed into the shape of gloves for the hands, scalps for the head, cushions for the breast or stomach, epaulets for the shoulders, belts for the loins, and other forms suited to be worn about the various parts of the person next to the skin.

These bags or receptacles are to be filled with such chemical materials, in a pulverised state, as are suited to the relief and cure of a variety of complaints, such as rheumatism, lumbago, cramp, and other pains arising from obstructed perspiration, or from any impediments to the free circulation of the fluids of the body.

Sulphur, senecca powder, rattle-snake powders, resinous gums, flowers or seeds of lavender, thyme, and a great variety of other matters will, if so applied, promote perspiration, and produce circulation where the passage of the fluids of the body have suffered partial obstruction; and if worn in the form above prescribed, will, in most cases, remove the complaint without the slightest inconvenience. —[*Inrolled in the Inrolment Office, January*, 1835.]

To WILLIAM BOULNOIS, *the younger, of Gower-street, in the county of Middlesex, Esq., for his invention of an improved combination or arrangement of springs for carriages.*—[Sealed 30th January, 1836.]

THIS invention is a peculiar combination of elliptical springs for carriages, so arranged that they shall be susceptible of a small degree of rocking or lateral action, as well as their ordinary up-and-down motion. The invention is very imperfectly described in the specification; but we will endeavour to give the inventor's intentions, though we are unable to explain or even understand some parts of his plan, which, as far as it is developed, appears to us to be perfectly impracticable.

Plate XIII., fig. 12, represents the combination of springs proposed, as it would appear in elevation: *a*, and *b*, are two ordinary elliptical springs, connected at their ends by joints in the usual way; *c*, is called the block, by which the upper spring is attached, we presume, to the body of the vehicle; *d*, a similar block, connecting the lower spring to the axletree of the running wheels, or to some other part of the framework.

The feature of novelty appears to be the apparatus called the blocks *c*, and *d*, which are jointed pieces, formed with an axle extending through them longitudinally, for the purpose of affording the rocking or lateral action. The plan and transverse section of the block is shown at fig. 13, and will not, we conceive, require any further explanation as to its construction; but what is to limit their action, and to keep the body of the vehicle supported upon them erect, we do not perceive.

An inner pair of elliptical springs *e*, *e*, are to be connected to *a*, and *b*, apparently by solid blocks. These springs are intended only to afford the up-and-down elastic action, rocking of course with the other springs upon the jointed blocks *c*, and *d*.

Another contrivance is proposed, in order to supersede the jointed blocks, which is thus described:—"This lateral action may also be obtained in other ways, thus; *f*, *f*, are small axes affixed to the outer ends of the springs; *a*, *b*, and *g*, *g*, are straps or collars, which receive the axes *f*, *f*, and those axes work within such straps or collars *g*, *g*, being affixed to the springs *a*, *b*, as is clearly shown in the drawing." If the reader understands this adaptation, it is more than we do.

The internal pair of springs, it is stated, are for the purpose of rendering the whole more easy when the carriage has a light load; but "when the carriage has a heavy load, then, the springs *e*, *e*, being pressed inward to a position where they will no longer act as a load on the springs *a*, and *b*, but will assume the position from which they have been drawn in the first instance, by affixing them to the springs *a*, *b*, and thus the springs *e*, *e*, becoming resisting springs, assist the springs *a*, and *b*, in sustaining the loaded carriage."

The Patentee concludes by saying, "that it is not essentially necessary that the whole of this combination of springs should at all times be employed together, as the invention may sometimes be usefully applied, by separately employing the lateral motion, without the loading springs *e*, *e*; and the loading springs may be used distinct from the lateral movement. And I would remark, that I lay no claim to the parts separately, they being well known; but what I claim as my invention of an improved combination of springs, is the giving them a lateral motion according to the principles herein described, and also the using of the loading springs *e*, *e*, as above described."—[*Inrolled in the Inrolment Office, July,* **1836.**]

To ROBERT HICKS, *of Wimpole-street, in the county of Middlesex, Esq., for his invention of an improved method of, and apparatus for, baking bread.*—[Sealed 21st February, 1833.]

THIS apparatus is described as consisting of a long rectangular boiler, having a flat bottom, upon which bottom (if we understand the specification), tubes are to be formed for the bread to be baked in. No drawing accompanies the specification, and though we have carefully read the description of the invention several times, it appears to be so unintelligible, that we are by no means certain we have conceived the Patentee's views fully.

If we understand it right, tubes wide enough to contain the loaves, are to extend from end to end of the boiler, and the steam generated within the boiler is to circulate along the external sides and over the tops of these tubes, for the purpose of giving the required heat for baking the bread within.

The boiler is to contain only a very small quantity of water, not more than half an inch deep, flowing over its bottom, and this supply is to be kept up uniformly by an injecting force pump, to be worked by hand. The fire being placed in the furnace under the boiler, steam will be generated within; and it is proposed to raise its temperature under pressure to 280 deg. Fahr. The small quantity of water employed is to prevent the pressure of the steam from acting forcibly upon the boiler. A safety valve is to be applied for the escape of the steam from the boiler, and the vapour emitted from the bread as it bakes, is described as creeping out at small holes in the ends of the tubes, which are closed by doors.—[*Inrolled in the Inrolment Office, August*, 1833.]

To Cornelius Tongue, *of Gateacre Park, in the county of Salop, Esq., for certain improvements in apparatus for preventing accidents to travelling carriages of various descriptions.*—[Sealed 25th September, 1834.]

This invention is a new edition of the many similar schemes that have gone before it for the same object, and which most of our readers must be familiar with. The intention of the Patentee is to place the shoe or skid used for checking the velocity, or as it is termed dragging the wheel of a carriage, under the immediate command of the coachman, guard, or passengers, as it may be thought desirable; in order that the vehicle may be restrained in its speed without the hindrance of stopping, and the necessity of some person descending to fix or adjust the shoe.

In Plate XIII., fig. 14, is a partial view of a carriage, with the improvements adapted thereto. Fig. 15, represents upon a larger scale the apparatus detached from the carriage; *a*, is a metal plate attached to the axle or other suitable part of the vehicle; this plate is bent into the form shown in fig. 15, so as to constitute a bearing for the short shaft *b*, which turns in it freely, and to which the bent lever *c*, is attached.

This lever, at its lower end, is formed as a fork, each prong being connected by a joint to two projecting studs at the sides of the skid pan or shoe *d*, which is provided with two projections *e*, *e*, serving as guides for the correct entrance of the wheel into the shoe; *f*, is a chain attached to the lever *c*, which passes over guide pulleys affixed to the body of the coach, and from thence to the seat of the coachman, guard, or other person intended to check the speed of the carriage. When it is desired to effect the drag, the chain *f*, is to be loosened, which will cause the lever *c*, to turn on its bearings in the plate *a*, and bring the skid down into a position to catch the felloe of the wheel; the skid being prevented from advancing too far under the wheel by the check-chain *g*, which is attached at its other end to the fore part of the carriage.

The Patentee states, "that an apparatus of this kind may be applied to wheels on opposite sides of the carriage, under the control of any person either inside or outside; and remarks in the conclusion of the specification, that he is aware similar apparatus have before been employed for effecting a drag without the necessity of some person descending from the carriage; but in such cases they have not been successful, owing to the shod pan not having been hung to the lever by a moveable joint, and it is the application of this joint for causing the shod pan to swing freely in its bearings, that he claims under the above letters patent.—[*Inrolled in the Inrolment Office, March,* 1835.]

To JOHN COX, *of the city of Bristol, of the firm of Harding, Cox, and Shaw, soap manufacturers, for his invention of certain improvements in the manufacture of soap, which will be particularly applicable to the felting or fulling of woollen cloths.*—[Sealed 22nd March, 1836.]

THESE improvements in the manufacture of soap consist in the use or application thereto of animal gall or bile, either in the rough state as it is collected from the gall or bile bladders, or bags of different animals, or after it has been refined, clarified, or purified, whereby such improved soap so manufactured and combined, or mixed with the said animal gall or bile, will have greater purifying, cleansing, or scouring properties than soap of the ordinary kind, and will therefore be more particularly applicable to the felting or fulling of woollen cloths or other woven fabrics or stuffs, or in the cleaning, purifying, or scouring of wool or worsted yarns or goods, or in the cleaning, washing, or scouring of any other kind of articles where grease, oily matters, dirt, or other impurities, are to be removed; and which improved soap is also applicable to all the ordinary purposes of common soap.

In order that my improvements may be better understood, I shall more particularly describe the process of mixing or combining the same with the ordinary ingredients of soap, and state such quantities as I have found to answer the purpose; but I do not mean or intend to confine myself to the precise quantities or operation herein stated, as the same may be varied to suit different kinds or qualities of soap used for different purposes (that is to say), on the second operation of making soap, that is, the boiling of the materials or ingredients, I put into the copper containing the materials or goods (as the oily or fatty matters and soda or leys) the animal gall or bile, in the proportions of about one part of gall or bile to ten parts of the other materials or goods, and treat or operate upon them by boiling and agitating in the usual manner of making or manufacturing of soap, until the process is completed, when the soap is put or run off into frames, moulds, or other receptacles, as in common; or the animal bile or gall may be mixed with the oily or fatty matters, or the soda or leys, previous to their being put into the boiling copper.

I would here remark, that I am aware that animal gall or bile has been heretofore used in the process of scouring and cleansing woollen and other goods, and for various other purposes; the bile or gall being put into the water and used with or without soap in the ordinary process of washing; but in this manner of using the gall, if kept for some time, it corrupts or putrifies, and is exceedingly disagreeable to the smell; and further, when wanted, gall cannot at all times be readily obtained; whereas this improved soap will be an article of commerce, and at all times be ready for use, and contain the proper quantity of animal gall or bile required for different purposes.

I am aware that animal bile or gall has of itself been called a soap, I therefore particularly wish it to be understood that I do not mean or intend to claim as my invention the application or use of animal gall or bile when unmixed or uncombined with the ingredients of soap; but I claim as my invention secured to me by the above in part recited letters patent, firstly, the application and use of animal gall or bile in the manufacture of soap when it is in the rough state, or as it is collected or comes from the gall bladders or bags of different animals; and secondly, after the said animal gall or bile has been purified, filtered, or prepared, as is commonly done for artists' use, the said gall or bile being commixed and combined with the compounds or ingredients of soap, and boiled or made up therewith in the ordinary process of soap making.

The soap thus made, and containing the said animal gall or bile, being a manufactured article of commerce, and fit for all uses where soap is necessary.

The rough bile or gall may be combined with the coarser kinds of soap as those used in the felting or fulling of woollen goods, cleansing wool or other such purposes, and the refined or purified gall or bile combined with the finer kinds of soap, and in such proportions as may be found desirable.—[*Inrolled in the Rolls Chapel Office, September, 1836.*]

Specification drawn by Messrs. Newton and Berry.

To CHARLES WATT, *of Clapham, in the county of Surrey, gentleman, for certain improvements in preparing, purifying, and refining tallow, stuff, fatty materials, and animal and vegetable oils, for various useful purposes.*— [Sealed 8th March, 1836.]

THIS invention of improvements in preparing, purifying, and refining tallow, stuff, fatty materials, and animal and vegetable oils, for various useful purposes, consist in subjecting rough fat, tallow, stuff, or other fatty materials, or animal oils, to a process of boiling with water and certain chemical agents, ingredients, materials, mixtures, or compounds hereinafter stated, for the purpose of separating the same from foreign matters and impurities, and rendering the materials better and more fit for the various purposes for which they are used; and particularly, *first*, as regards tallow for the purpose of separating or liberating the tallow from the animal substances containing gelatin, fibrin, albumen, or colouring matter, and if necessary, afterwards washing, or purifying, or refining the same, in order to remove the said chemicals. And *further*, as regards animal oils, in submitting them to a similar process of boiling, with certain chemical ingredients, for the purpose of removing impurities, and refining or purifying the same; and after this first boiling and washing, or boiling them a second time with certain other chemicals, to remove or neutralise the former, and at the same time purifying, refining, or washing the oils. And *lastly*, in refining or purifying vegetable oils, and operating upon them with certain chemical agents or compounds, for the purpose of removing impurities, and rendering them better and more fit for various purposes, which I propose to carry into effect in the following manner:—

In order that my improvements may be better understood, I shall detail the process or operation, stating such proportions, quantities of water, acids, and other chemical agents, materials, ingredients, or compounds, as I have found best to answer the desired purpose; but I do not intend to confine myself to the precise quantities hereinafter stated, as the same may be varied to suit different qualities, and state of foulness of the stuff, rough fat, tallow, or oils, or other raw materials to be operated upon. *First,* as regards the operation or process of purifying rough fat, or stuff, or fatty materials, for melting or refining and purifying of tallow, I proceed in the following manner:—

The rough fat, without the necessity of being previously prepared, or chopped into small pieces, is to be put into a wooden *rendering* vat, furnished with a wooden steam-pipe, leading from a steam boiler or generator, and branching out into several other pipes placed in the bottom of the vat, and pierced with small holes, in order to distribute the steam throughout the whole mass of materials under operation. To about *each ton* of rough fat in the rendering vat I add about four gallons of water, and then let on the steam, and continue it until the mass boils, when I add, as hereafter directed, the following chemical mixture or compound, prepared an hour or more before it is wanted. First, I take four pounds of good sulphuric acid (which I prefer to be of the specific gravity of about 1,900), which is gradually and continuously to be diluted, by pouring it very slowly into two gallons of cold water, contained in a wooden vessel, the water being repeatedly stirred with a stick during the mixing; or muriatic acid may be substituted for sulphuric acid, when eight pounds of it will be required instead of four of the former, and only half the quantity of water. In this case there is no necessity for any particular caution in the mixing, as with sulphuric acid there is no disengagement of heat.

To either of the above mixtures of diluted acids, when cold, I add one pound of good nitric acid, which I prefer, of about the specific gravity 1,045, and then half a pound of the bichromate of potassa, in order to supply an additional quantity of oxygen, and to prevent any discolouration by the use of the nitric acid, and to these I add half a pound of oxalic acid; the whole is then to be well stirred, and when sufficiently mixed, one quart, or three pints of this compound (to each ton of rough fat or stuff), is to be put into the boiling materials in the rendering vat, at intervals of about every twenty or thirty minutes, and the boiling continued until the dabs or lumps are nearly dissolved. When this is the case, I add to the materials under operation, the following compound, prepared only at the time it is about to be used, in the proportion to every ton of fat or stuff. I first dilute or mix one pound of strong nitric acid with one quart of water, into which mixture I put two ounces of rectified spirit of wine, naphtha, sulphuric ether, or spirit of turpentine. After this compound has been added to the fat under operation, the boiling is to be continued for about half an hour; and after all the dabs, or pieces of rough fat are "*rendered*" or melted, the steam is to be stopped off, and the tallow left quiet about ten minutes, for the purpose of allowing the refuse to settle where the water and chemicals underneath the tallow are to be drawn off, and about two gallons of fresh water to each ton of rough fat or stuff is to be then put in the rendering vat, and the steam let on again and continued till the tallow has boiled about ten minutes. After this washing process the boiling is to be stopped, and the materials left to settle, in order that the tallow may become cool, and fit to be packed off.

In *rendering* fish oils in wooden vessels, that is boiling or melting, and partly refining and purifying, such as whale blubber, fish livers, and other parts containing fish oils, the following modification of the process is necessary:—

The *rendering* mixture, in this case, should contain the following proportion of sulphuric and muriatic acids: viz. four pounds of the former diluted with two gallons of water, as described in the former part of this specification (respecting tallow), and six of the latter acid also diluted with two gallons of water. These diluted acids are to be mixed together after the diluted sulphuric acid has become cold; and to this compound is then to be added, and well stirred therewith, half a pound of bichromate of potassa, and a like quantity of oxalic acid. This compound is to be added to the boiling animal oils, at intervals of twenty or thirty minutes, in the proportion of two quarts at each time of adding to every ton of materials under operation, until all the fatty or oily substances (such as whale blubber, livers of fish, and other parts containing oil) are reduced or *rendered.* This will be shown on examining the mass under operation, and indicated by any parts containing oil floating beneath the surface of the fluid oil, and above the surface of the water; and thereby the operator will know if the process is to be stopped or continued.

After this operation is performed, the under liquid and chemicals may be drawn off, and about two pounds weight of powdered chalk or marble to each ton of raw material is to be thrown into the vat, and well stirred therewith, when the whole is to be boiled for ten or twenty minutes, in order that the chalk or marble may combine with and remove any acid adhering to the oil. The now rendered or purified oil, is then allowed to settle, when it might be removed for use.

In the further refining and purifying of *tallow*, if necessary, or thought desirable at the time, the fresh water is put into the vat, after the pumping or drawing off the under water and chemicals, the *rendering* being completed, there may be added to every ton of tallow a half pound of green oxide of chrome or bichromate of potassa, and boiled with the materials under operation for about ten or fifteen minutes, by turning on the steam, the colour, odour, and other properties of the tallow, will be much improved by the process.

In *refining* and purifying animal and vegetable oils generally, when in their fluid state, as articles of commerce, the following compounds are to be added to every ton of oil:—A quantity, say one quart, of the before-mentioned mixture of muriatic acid and oxide of chrome, or bichromate of potassa, the oil being stirred well at each time this compound is added; the operation or commixture to be continued, until all the offensive odour, colouring matter, or impurities, are removed. I then introduce about three gallons of water to every ton of oil, and from two to three pounds of powdered chalk or marble, to remove any acids adhering to the oils. The oil is then to be left quiet until all the chemicals and water have settled, and it has become transparent, when it may be run off into barrels for use.

In the case of palm oil, it being ordinarily in a solid state, it must be raised by artificial heat to the temperature of about 120 deg. Fahrenheit's thermometer; and the refining mixture will require to contain in the proportion of about one pound and a half of green oxide of chrome or bishromate of potassa, and four pounds of muriatic acid, to each ton of rough material, instead of the former proportions; and when the colouring matters are removed, the same quantity of chalk or marble is to be added, as in the former case, and three or four gallons of water, and the whole raised to the temperature of about 150 deg., when the materials will become sufficiently fluid to allow all the chemicals to subside; and after the same have been sufficiently stirred together, the whole may be kept at rest a sufficient time to allow the oil to become clear, and the chemicals to subside, when the oil may be used in various manufactures.

The Patentee concludes by saying, " Having now described my improvements and the manner of carrying the same into effect, and in such proportions and quantities as I have found to answer the purpose, I wish it to be understood that what I claim as my improvements in the preparing, purifying, and refining tallow, &c. is the boiling and operating upon them by the following compounds, chemical ingredients, or mixtures: viz. I claim the combination of sulphuric and nitric acids, and muriatic and nitric acids, for the purpose of 'rendering' in wooden vessels, and likewise oxalic acid, both singly and compounded, as described; and likewise the bichromate of potassa, as it much improves the tallow, and prevents the occasional temporary discoloration occasioned by nitric acid; I likewise claim the combination of nitric acid, with spirits of wine, naphtha, ether, or turpentine, as evolving nitrous gas and nitrous oxide for the purpose of rendering, and, by their agency, purifying and solidifying the tallow; I also claim the admixture of sulphuric and muriatic acids and oxalic acid, in rendering fish oils, as whale, seal, cod, &c.; I also claim the combination of muriatic acid with oxide of chrome, by which combination there results a double effect, viz. the bleaching or purifying, and refining effect of the bichromate of potassa or oxide of chrome, and the immense evolution of chlorine gas resulting from the decomposition of the muriatic acid or bichromate of potassa, for refining and bleaching vegetable and animal oils generally, and particularly as applied to palm oil, which I prefer operating upon at about the temperature of 120°, as that at which the effect is rendered most certain for success and steady operation.—[*Inrolled in the Rolls Chapel Office, September,* 1836.]

To HUGH LEE PATTINSON, *of Summer Hill-terrace, in the parish or parochial chapelry of St. John, in the county of Northumberland, agent, for his improved method of separating silver from lead.*—[Sealed 28th October, 1833.]

IN order to render the subject of this patent intelligible to the general reader, some introductory remarks should have been given as to the natural state of combination in which silver is sometimes found in the ore with lead; but the specification merely assumes the existence of the combination of a small quantity of silver in lead; and states, as is well known to metallurgists, that it is difficult to extract the silver from the lead without destroying the latter by the operation; and that the entire sacrifice of the lead causes the expense to be so great, that the silver, when withdrawn, is found to have been more costly than valuable.

The improved method of proceeding proposed by the Patentee, arises from the discovery, that if lead, containing a small quantity of silver, is melted, and cooled slowly, that the pure lead will form in small particles like crystals on the top of the molten metal, and will, as it forms, gradually descend to the bottom, from whence it may be withdrawn by a strainer ladle, leaving the silver in the vessel with the fluid metal.

The mode of treating the compound metal, therefore, is to melt it, and suffer it to cool very gradually; then withdraw the small particles as they are formed, and submit these particles, as they are drawn out, to the heat of a reverberating furnace, by holding them in the strainer ladle within the furnace. This will cause some fluid metal to run out from the particles, which fluid is to be returned into the vessel it was first melted in, among the residuum of fluid metal.

By carrying on and repeating this process for some time, a great portion of pure lead will be withdrawn, and the silver left with the fluid metal in the melting pot, the lead having been reduced from its original quantity to about one-third; and this portion or residuum containing all the silver, may, with profit, be operated upon to obtain the silver in a pure state, while the other two-thirds of the metal being pure lead, having been preserved, may be melted for the purposes of commerce.—[*Inrolled in the Inrolment Office, December,* 1833.]

NOVEL INVENTION.

IRON WIRE SUSPENSION PIER AT GRIMSBY.

The practice of constructing bridges of iron wire, which has so extensively prevailed of late in France and other parts of the continent, is now beginning to come into operation in these kingdoms; but in our opinion, under much more promising prospects of advantage and durability, than are held out by any of those slender and comparatively temporary structures erected in other countries.

In the seventh volume of our present Series, page 359, we gave the specification of Mr. Andrew Smith's improved mode of constructing the standing rigging for ships, by combining iron wires in close contact, and cementing them together by caoutchouc (Indian rubber), and other anti-corrosive compositions. This invention has been very successful on ship-board, as its advantages have been found to be very great, the effects of oxydation having been totally prevented, and the weight of the materials, for any given strength less than half that of hempen ropes, perfectly flexible, and equally capable of being spliced.

This invention has been followed by other modifications and adaptations of the same elementary principles, and secured under subsequent patents, which we have not yet been able to report; and it is with these improved bands, rods, or cords that Mr. Smith is about to construct a very extensive pier, jutting into the sea at Grimsby, which being the first of its kind in this country, will no doubt attract considerable attention.

SCIENTIFIC NOTICES.

SMOKE AND CHEMICAL NUISANCES.

(*From the Liverpool Mail.*)

A dispute has been carried on for some time in this town, as to the consequences to the health of its inhabitants, of the abominable smells which are constantly emitted from the various works requiring large fires to carry on their operations. It has been argued in the course of these discussions, that muriatic and other corrosive gasses possess disinfecting qualities; but does it follow as a matter of course, that because one disagreeable vapour may neutralize another but still more intolerable stench, the whole should be quietly and passively borne "for the public good" as well as for the benefit of those engaged in conducting them? If it can be proved that these works may be carried on unaccompanied by the annoyances complained of, it becomes the especial duty of those in whose hands the local government of the town is placed, to interfere in order to secure to us generally, and more particularly to those who live in the neighbourhood of Vauxhall, the sight of "the blessed noon-day sun," unobscured in its meridian splendour by a dense cloud of smoke.

Mr. Coad's apparatus * for the consumption of smoke has answered the most sanguine expectations formed of it by his friends He has erected an experimental fire-place at the Literary and Scientific Institution, St. Anne-street, where it may be daily seen in operation for the express purpose of being examined by any one who may be disposed to take that trouble. Its adoption, we have been informed on good authority, would, independently of removing the smoke nuisance, also effect a very considerable saving in the consumption of fuel, which would not only speedily repay the expenses incurred by its use, but leave a very handsome profit. If this be true, as coal is an important article in most manufactories, it must be of immense consequence in steam navigation, particularly in the distant voyages about to be undertaken; for if with Coad's fireplaces less fuel is necessary, and the saving will it is supposed exceed twenty-five per cent., it follows that there will be a larger space remaining in these vessels applicable to other purposes. Their own interest will therefore most likely induce the steam-packet companies to turn their attention to this subject.

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* For the specification of this invention, see vol. viii., p. 301, of our present Conjoined Series.

The chemical nuisance most complained of here, arises from the escape of muriatic gas, which takes place in the decomposition of the muriate of soda—salt. This, although a disinfecting gas, destroys vegetable life, and, from its affinity to iron, corrodes the moment it comes in contact with that metal. The matter becomes, therefore, one of considerable importance to those who wish to preserve the *comforts* as well as the privacy of their homes from being invaded. This nuisance Mr. Coad also undertakes to destroy. He states that he can apply the gas from which it arises, by reducing it to another form during the process which generates it, to a useful purpose, and very materially improve by its agency the quality of an important article of British manufacture. If he can do this, the gas now permitted to escape to our annoyance may be changed into a commodity of great commercial value. To those who may be disposed to doubt the possibility of extracting caloric from smoke, we would say, how many thousands of persons are there now living, who within the last thirty years treated the introduction of gas-light into general use as the dream of a visionary enthusiast, and who laughed at the bare idea of being propelled at the rate of thirty miles an hour by locomotive steam power! Both these objects, each of them at one time apparently unattainable, have been accomplished. We have only to add, in urging those who are interested in promoting the success of Mr. Coad's patent, and they comprise the inhabitants of almost every large town in England, that experiments have placed its success beyond a doubt.

ARTESIAN WELLS.

M. Arago, in lately delivering a lecture on the theory of the central heat of the earth, related an operation, at this time carrying on in Paris, which may be of the highest importance, not only to science but to the public economy. The Municipality have ordered an artesian well to be pierced near the Barriere des Martyrs; but the men employed, after getting to a depth of 900 feet without finding water, came to a stratum of chalk, so thick, that the undertaking would have been given up but for the interference of men of science, who wished it to be continued with the view to the elucidation of the above theory. According to observations made by means of a thermometer, a maxima no doubt remains as to the fact, which hitherto it has not been possible to verify with any degree of precision, namely, that the temperature of the earth rises in regular proportion towards the centre; so that, at the tenth degree from the surface, all known matter must be in a state of fusion. At the point to which the perforation in question has reached, M. Arago expects a spring of water will arise of a sufficient degree, to warm public establishments, supply baths, and serve for other purposes.—*Mining Journal.*

MACHINE FOR RAISING WEIGHTS.

There is now on exhibition at the Mining-hall, near Exeter-hall, a very ingenious machine for the upward transmission of weights of any description, which deserves the attention of mine proprietors, wharfingers, &c., as calculated to save a great deal of time, labour, and expense. The construction of this power is simple, and its steady operation well assured. Its chief agent is a pair and series of wheels, moving with their diameters in the direction the weight to be raised. Taking the one pair of wheels moving in the same fixed axis, we find that from one end of the radius or arm in each, a chain descends so as to hang on the opposite side of each chain : quadrangular frames are suspended at regulated distances, to the upper sides of which frames, strong projecting arms are attached, moving upon the principle of the hinge; and boxes or receptacles for the weight to be raised, have corresponding ones on each side. When the wheel above is turned, a single body below is caught by its rim, and by one revolution of the wheel it is sent up as high as the frame on the opposite side to that to which it is borne; here again it is caught, and sent up to the apparatus on the opposite side; and so on, by a ternate transmission, it is brought to the top of the shaft. The machine is constantly laden below, and each revolution of the wheel above delivers a box, and thus, in an exceedingly short space of time, a vast body of matter can be carried up through any depth of shaft. The machine may be humanely employed in great mines for quickly sending the workmen up and down, in substitution of the present defective and dangerous modes; as the operation of the machine may be accelerated or diminished, or wholly stopped at any moment, with perfect facility and convenience.

DESTRUCTION OF THE PATENT-OFFICE AT WASHINGTON, IN AMERICA, BY FIRE.

THE total destruction of the Office of Records in Washington, is announced in an American paper; in which calamity, among other things, all the books and specifications of modern invention are stated to have been lost, and the whole of that vast and unparalleled collection of models have fallen a sacrifice. We give the account in the words of the American paper, and exceedingly regret that such a national calamity has occurred.

" It is with no ordinary regret that we perform the duty of announcing the destruction, by fire, of the building in the central part of this city, which has for many years been occupied by the general post-office and patent-office, and the city post-office, with an important part of the contents of those buildings, including the entire contents of the two latter. This calamity, great as it is, has long been feared by those old residents of Washington who knew the combustible nature of the building (the floors being all of wood, and some of them not even countersealed), and the custom of stowing fuel, not only coal, but wood, in the vaults underneath the first floor. The calamity has come at last, and affords the second demonstration, within four years, of the utter absurdity and improvidence of the structures to which the public archives, records, and Government accounts have been hitherto, for the most part, confined.

The first alarm of fire was given by Mr. Crown, a messenger, who usually sleeps in the room connected with the city post-office (the post-master's own room). The clerks had been at work, assorting the mails, until half-past two o'clock, when one of the persons belonging to the office (Mr. Lansdale) passed out of the east door, and along the whole front of the building, without discovering any thing to give rise to a suspicion of danger. Not long after three o'clock, Mr. Crown was roused from a light slumber by the smell of smoke. Opening the door of the city post-office, he perceived a dense smoke, without any visible appearance of fire. He gave the alarm instantly, first rousing Mr. Cox, one of the clerks who slept in the back room adjoining the post-office, and who, coming out of the door of his room, passed along the whole of the long room with difficulty through the smoke, hearing the fire cracking, but being able to see nothing. The watchmen in the body of the building, some distance from the city post-office, had perceived nothing of the smoke until they also were alarmed by Mr. Crown. The hour of the night when all this took place being one at which the whole world is buried in the deepest sleep, it was found almost impossible to spread the alarm of fire. One of the church bells began to ring, but the ringer not seeing any flame, ceased ringing almost as soon as he began, and it was a full half hour before the alarm-bells were rung, and more than that time before an engine or a bucket of water could be commanded. As it was, the fire had its own way, and was at last seen in the vault or cellar immediately under the delivery window of the city post-office; followed shortly afterwards by flames from the windows of the latter, and within five minutes afterwards by flames from the roof, the fire having crept up along the staircase, or partitions, to the top of the building, before it broke out below. From the moment of the flames bursting out from the lower windows, it was obvious that all hope of saving the building was in vain. In little more than one hour, the whole interior of the building and its contents were destroyed. The books of the general post-office were all, or nearly all, saved, exertions having been made for their safety from nearly the first moment of the alarm; but a mass of papers, &c. belonging to the office were destroyed.

Nothing was saved from the patent-office or the city post-office, the volume of the smoke preventing any body from penetrating the latter so as to save any thing. As to the origin of the fire, it is impossible to say any thing, for nothing seems to be known of it except that it was in a cellar or vault in which pine-wood and coal were stowed, all of which were probably in a state of ignition before the fire disclosed itself to the eye. We the more willingly forbear any conjecture as to the cause of the fire, since both Houses of Congress have taken steps, through committees, to investigate it; and in one house with power to send for persons and papers. Most fortunately the night was calm and comparatively serene, or the destruction of private property would have been inevitable and great. Had it occurred on the night previous, when the wind blew almost a hurricane, several squares of valuable buildings must have been destroyed. The means of the city for extinguishing fires are wholly inadequate to the value of the property at stake, and the sources for the supply of water for the engines are limited in their extent, as well as precarious. We trust that the lesson we have just received will not be lost on those who have it in their power to apply the remedy. Of all the amount of loss of papers and property sustained by this disaster, that which is most to be regretted (because irreparable) is that of the whole of the great repository of models of machines in the patent-office. The mouldering ashes now only remain of that collected evidence of the penetration, ingenuity, and enterprise which peculiarly distinguish the descendants of Europe in the Western world."

List of Patents

Sealed in Scotland between 24th Dec. 1836, and 20th January, 1837.

To John Burns Smith, of Salford, Lancaster, cotton spinner, for certain improvements in the machinery for roving, spinning, and twining cotton and other fibrous substances.—24th December.

To John Roberts, of Prestole, Prestwich, cotton spinner, for certain improvements in the art of block printing.—28th December.

— William Neale Clay, of West Bromwich, Stafford, for improvements in the manufacture of sulphate of soda.—28th December.

— James White, of Lambeth, for certain improvements in railways. —31st December.

— Baron Henry de Bode, Major-General in the Russian service, of the Edgware-road, London, for improvements in capstans.—31st December.

— William Sharpe, of Glasgow, merchant, for a certain improvement in the treatment of cotton wool in preparation for manufacturing the same into yarn and thread.—4th January, 1837.

— William Glass Cooper, stained glass manufacturer, Edinburgh, for an improved method of executing ornaments, devices, colours, or stains on glass.—12th January.

— Hamer Stansfeld, of Leeds, in consequence of a communication made to him by a foreigner residing abroad, for certain improvements in machinery for weaving, one of which improvements is applicable to other purposes.—13th January.

— Thomas Vaux, of Woodford-bridge, Woodford, Essex, land surveyor, for a certain mode of constructing and applying a revolving harrow for agricultural purposes.—14th January.

— Charles Thornton Couthorpe, of Wraxall, Somersetshire, for certain improvements in the manufacture of certain descriptions of glass.—18th January.

— John Ruthven, of Edinburgh, for an improvement in the formation of rails or rods for making railways, and in the method of fixing or joining them.—20th January.

New Patents
SEALED IN ENGLAND,
January, 1837.

To Hamer Stansfeld, of Leeds, in the county of York, merchant, for an invention, being the application to certain machinery of a tappet and lever action, to produce a vertical or horizontal movement through the medium of ropes or bands working over, under, or round, pulleys, being a communication from a foreigner residing abroad.—Sealed 30th December—6 months for inrolment.

To William Cooper, of Picardy-place, in the city of Edinburgh, in Scotland, glass merchant and stained glass manufacturer, for his invention of an improved method of executing ornaments, devices, colours, or stains on glass. —Sealed 10th January—6 months for inrolment.

To Robert Griffiths, of Smethwich, near Birmingham, in the county of Warwick, machine maker, and Samuel Evers, of Cradley iron-works, in the county of Stafford, iron manufacturer, for their invention of improvements in the manufacture of burs or nuts for screws.—Sealed 11th January—6 months for inrolment.

To Henry Adcock, of Summer Hill-terrace, Birmingham, in the county of Warwick, engineer, for his invention of certain improvements in the construction of the furnaces employed in the reduction of iron ores and other metallic ores; as also in some of the processes of the iron manufacture of other metals, such furnaces being applicable to other purposes.—Sealed 11th January—6 months for inrolment.

To James Gardner, of Banbury, in the county of Oxford, ironmonger, for his invention of certain improvements in cutting Swedish and other turnips, mangel-wurzel, and other roots used as food for sheep, horned cattle, and other animals.—Sealed 11th January—6 months for inrolment.

To Charles Sheridan, of Ironmonger-lane, in the city of London, chemist, for his invention of improvements in the manufacture of soda.—Sealed 11th January—6 months for inrolment.

To John Paul Neumann, of 81, Great Tower-street, in the city of London, prussiate of potash maker, for improvements in the manufacture of prussiate of potash and prussiate of soda, being a communication from a foreigner residing abroad.—Sealed 11th January—6 months for inrolment.

To George Goodlet, of Leith, in the county of Edinburgh, merchant, for his invention of a new and improved mode of distilling from wash and other articles, also applicable to general purposes of rectifying, boiling, and evaporating or concentrating.—Sealed 11th January—6 months for inrolment.

To Francis Gybbon Spilsbury, of Newman-street, Oxford-street, in the county of Middlesex, engineer, and William Maugham, of Newport-street, Lambeth, in the county of Surrey, chemist, for their invention of certain improvements in the manufacture of carbonate of soda.—Sealed 11th January—6 months for inrolment.

To John Macneill, of Parliament-street, in the county of Middlesex, civil engineer, for his invention of improvements in making or mending turnpike or common roads.—Sealed 11th January—6 months for inrolment.

To James Brady, of Duke-street, Stamford-street, in the parish of St. Mary, Lambeth, in the county of Surrey, wheelwright and coachmaker, for his invention of certain improvements in the construction of carriages.—Sealed 11th January—6 months for inrolment.

To Robert Sewell, of Carrington, in the parish of Basford, in the county of Nottingham, lace manufacturer, for his invention of certain improvements in the manufacture of white lead.—Sealed 11th January—6 months for inrolment.

To Charles Thornton Coathupe, of Wraxall, in the county of Somerset, glass manufacturer, for his invention of certain improvements in the manufacture of certain descriptions of glass.—Sealed 11th January—6 months for inrolment.

To John Gall, of Aberdeen, in the kingdom of Scotland, carpenter and builder, for his invention of an improved mode of priming fire-arms, applicable to percussion locks.—Sealed 17th January—6 months for inrolment.

To Arthur Dunn, of No. 22, Nelson-street, City-road, in the county of Middlesex, manufacturing chemist, for his invention of an improved mode of dissolving silicious matter and compounds of silica, and of manufacturing soap.—Sealed 17th January—6 months for inrolment.

To William Gossage, of Stoke Prior, in the county of Worcester, chemist, for his invention of certain improvements in manufacturing oxide of lead, applicable to making paints, and to other purposes; also, certain improvements in the process of bleaching and purifying oils, suitable for mixing paints and other oils and fatty matters.—Sealed 19th January—6 months for inrolment.

To John Murray, of Fitzroy-square, in the parish of St. Pancras, in the county of Middlesex, gentleman, for his invention of certain improvements in the construction of carriages.—Sealed 19th January—6 months for inrolment.

To Moses Poole, of Lincoln's Inn, in the county of Middlesex, gentleman, for certain improvements in ordnance and other fire-arms, being a communication from a foreigner residing abroad.—Sealed 19th January—6 months for inrolment.

To Henry Needham Scrope Shrapnell, of Bayswater terrace, in the county of Middlesex, Esq., for his invention of certain improvements on snuffers.—Sealed 19th January—6 months for inrolment.

To William Stedman Gillett, of Guildford-street, in the county of Middlesex, gentleman, for his invention of improvements in trimming and facilitating the progress of vessels in water.—21st January—6 months for inrolment.

To Julius Oliver, of Castle-street, Falcon-square, in the city of London, gentleman, for a certain improvement in the filters employed in sugar refining, being a communication from a foreigner residing abroad.—24th January—6 months for inrolment.

To Joshua Cuttel, of Hollingforth, near Huddersfield, in the county of York, woollen manufacturer, for improvements in producing slubbings of, and in spinning wool, being a communication from a foreigner residing abroad.—26th January—6 months for inrolment.

To James Hellewell, of Springfield-lane, in the borough of Salford, and county of Lancaster, dyer, and Aaron Fearn, of the borough of Salford, and county of Lancaster, dyer, for their invention of certain improvements in the process of dyeing and scouring piece goods and other fabrics, and in the machinery or apparatus whereby the same is performed.—Sealed 27th January—6 months for inrolment.

To Miles Berry, of the office for patents, Chancery-lane, in the county of Middlesex, patent agent, for an invention of certain improvements in machinery or apparatus for making or manufacturing metal screws, part or parts of which are also applicable to shaping metal for other purposes.—Sealed 27th January—6 months for inrolment.

CELESTIAL PHENOMENA, for February, 1837.

D.	H.	M.	
1			Clock before the ☉ 3m. 57s.
	—		☽ rises 4h. 30m. M.
	—		☽ passes mer. 8h. 9m. M.
	—		☽ sets 11h. 41m. M.
	14	33	♃ in opp. to the ☉
			Occul. (859) Sagitt. im. 18h. 37m., em. 19h. 47m.
3	1	12	♀ in conj. with the ☽ diff. of dec. 4°. 55. N.
	6	51	♃'s second sat. will em.
4	4		☽ in Perigee
	5	29	☿ in inf. conj. with the ☉
	8	16	☿ greatest Hel. Lat. N.
	16	6	☿ in conj. with the ☽ diff. of dec. 8. 59. N.
5			♀ in descending node.
	—		Clock before the ☉ 14m. 22s.
	—		☽ rises 8h. 15m. M.
	—		☽ passes mer. 0h. 26m. A.
	—		☽ sets 4h. 49m. A.
	6	41	♄ in quad. with the ☉
	10	8	Ecliptic conj. or ● new moon.
	14	45	♂ in opp. to the ☉
	22	52	♅ in conj. with the ☽ diff. of dec. 4. 0. N.
7	20		♂ greatest Hel. Lat. N.
8	13	7	♃'s first sat. will em.
10	7	36	♃'s first sat. will em.
	—		Clock before the ☉ 14m. 35s.
	—		☽ rises 9h. 34m. M.
	—		☽ passes mer. 4h. 37m. A.
	—		☽ sets 11h. 58m. A.
12	9	38	☽ in □ or first quarter.
	—		Occul. 32 Tauri, im. 10h. 19m., em. 10h. 28m.
	—		Occul. κ in Tauri, im. 14h. 31m., em. 14h. 41m.
14			Mercury R. A. 20h. 35m. dec. 15. 46. S.
	—		Venus R. A. 20h. 18m. dec. 20. 5. S.
	—		Mars R. A. 9h. 11m. dec. 20. 58. N.
	—		Vesta R. A. 19h. 48m. dec. 20. 59. S.
	—		Juno R. A. 14h. 8m. dec. 6. 4. S.
	—		Pallas R. A. 1h. 21m. dec. 2. 32. N.
14			Ceres R. A. 0h. 26m. dec. 5. 39. S.
	—		Jupiter R. A. 8h. 57m. dec. 18. 14. N.
	—		Saturn R. A. 15h. 1m. dec. 14. 38. S.
	—		Georg. R. A. 22h. 24m. dec. 10. 44. S.
	—		☿ passes mer. 22h. 54m.
	—		♀ passes mer. 22h. 42m.
	—		♂ passes mer. 11h. 31m.
	—		♃ passes mer. 11h. 17m.
15			Clock before the ☉ 14m. 28s.
	—		☽ rises 11h. 41m. M.
	—		☽ passes mer. 8h. 41m. A.
	—		☽ sets 4h. 48m. M.
	15	1	♃'s first sat. will em.
16	4	22	♀ stationary.
	19		☽ in Apogee.
17	3	38	☿ in conj. with ♀ diff. of dec. 2. 47. N.
	9	30	♃'s first sat. will em.
	12	5	♃'s second sat. will em.
18	6	32	♃ in conj. with the ☽ diff. of dec. 4. 14. S.
	—		Occul. Mars, im. 10h. 51m., em. 12h. 0m.
	11	15	♂ in conj. with the ☽ diff. of dec. 0. 35. N.
19	11	49	♃'s third sat. will em.
20			Clock before the ☉ 14m. 2s:
	—		☽ rises 5h. 13m. A.
	—		☽ passes mer. M.
	—		☽ sets 7h. 34m. M.
	2	23	Ecliptic opp. or ○ full moon
22	18	41	♅ in conj. with the ☉.
	16	56	♃'s first sat. will em.
24	11	24	♃'s first sat. will em.
	14	42	♃'s second sat. will em.
	19	26	♄ stationary.
25			Clock before the ☉ 13m. 20s.
	—		☽ rises 11h. 27m. A.
	—		☽ passes mer. 3h. 27m. M.
	—		☽ sets 8h. 33m. M.
26	3	48	♄ in conj. with the ☽ diff. of dec. 3. 57. N.
	15	48	♃'s third sat. will em.
27	20	22	☿ in descending node.
28	5	31	☽ in □ or last quarter.

J. LEWTHWAITE, Rotherhithe.

METEOROLOGICAL JOURNAL,

FOR DECEMBER, 1836, AND JANUARY, 1837.

	Thermo.		Barometer.		Rain in inches.		Thermo.		Barometer.		Rain in inches.
1836.	Hig	Low.	High.	Low.		1837.	Hig.	Low.	High.	Low.	
Dec.						Jan.					
26	32	25	29,61	29,53		10	49	41	29,84	29,69	,05
27	33	27	29,67	29,52		11	33	20	30,08	29,98	
28	34	24	29,86	29,79		12	36	19	30,06	29,65	
29	32	22	29,95	29,91		13	49	29	29,53	29,34	,225
30	33	23	30,04	29,97		14	39	30	30,10	29,82	,15
31	33	20	30,30	30,16		15	38	26	30,28	30,25	
1837 Jan.						16	37	25	30,22	30,20	
1	34	25	30,40	30,37		17	43	31	30,19	30,16	,025
2	33	6	30,29	30,28		18	39	33	30,08	30,01	,025
3	40	28	30,22	30,20		19	39	30	29,89	29,80	,025
4	36	24	30,25	30,20		20	37	30	29,71	29,64	
5	37	29	30,10	29,85		21	43	33	29,59	29,54	,025
6	47	35	29,61	29,57		22	51	37	29,41	29,25	,0125
7	42	33	29,79	29,54	,1	23	51	45	29,38	29,35	,1875
8	37	25	30,15	30,04		24	51	44	29,57	29,44	,15
9	48	31	30,09	30,07		25	44	41	29,58	29,51	,425

The sudden and great fall of the thermometer on the morning of the 2nd, has not been equalled since February, 1830; the rise on the same day was even more rapid.

Edmonton. CHARLES HENRY ADAMS.

Latitude 51° 37 32 N.
Longitude 3 51 West of Greenwich.

THE
London
JOURNAL AND REPERTORY
OF
Arts, Sciences, and Manufactures.

CONJOINED SERIES.

No. LX.

Recent Patents.

To WILLIAM CHURCH, *of Heywood House, Bordesley Green, in the county of Warwick, gentleman, for his invention of certain improvements in apparatus to be employed in the conveyance of goods and passengers by land or water; part of which said improvements are also applicable to the ordinary purposes of steam-engines and other steam apparatus.* — [Sealed 16th March, 1835.]

(Continued from p. 265.)

THE improvements in locomotive carriages, which form the third head of the present inventions, are exhibited in the several figures of Plate XV. First, in reference to the construction of the boilers for steam locomotive carriages to be employed on common roads: fig. 1, is a plan or horizontal view; fig. 2, is a side elevation; fig. 3, is a longitudinal section taken vertically; and figs. 4, and 5, are horizontal sections of the same: *a, a, a*, are the various water chambers of the boiler, surrounding the furnace flues, and fuel or coking chamber; *b*, the steam chamber, where the safety valves and steam gauge should be placed; *c*, the furnace or fire-place; *d*, the fire-bars, which are composed of tubes filled with water, and connected to the transverse water chambers *e*, and *f*. The bridge is shown at *g*; and *h, h*, are flues passing upward through the main water chamber, delivering into the chimney *i*. The fuel is supplied to the furnace through the hopper *k*, furnished with double shutters, and opening into the coking oven or chamber *l*, where the coal becomes coked, and partly ignited; the flame, smoke, or gasses, produced by the coking of the coal, passing through the opening *m*, to the ignited fuel in the furnace, where the smoke becomes consumed in its passage to the chimney; and through this opening the coked fuel descends to supply the fire. The aperture *n*, is for supplying the coking oven with air to produce partial ignition; and *o*, is a forked holder, which retains the fuel in the oven during the time of stoking, and is moved over the aperture *m*, when required, by a rack and pinion, or by other means; *p, p*, are the doors which allow of the tubular flues being cleaned when requisite; *q, q*, are standards bolted on to the top part of the boiler, to which the cylinders of the engine are attached; *r, r*, are steam-ways, connecting the top of the coking oven with the steam chamber. As the same description of boiler is shown, connected with the other parts of the locomotive carriage in the drawings hereinafter referred to, no particular description is necessary.

In reference to the arrangements of the various parts
a locomotive engine, intended to run upon common road
to propel carriages, fig. 6, is a side elevation of the loc

motive engine, the outside casing which encloses the working parts being removed, in order to expose them to view. Fig. 7, is a front view of the same. Fig. 8, is a plan or horizontal representation; and fig. 9, is a vertical section taken longitudinally, through the boiler, furnace, water tank, fuel chamber, and other parts. Fig. 10, is a horizontal section: A, A, is the furnace or fire-place, which receives its supply of fuel from the coking oven, or chamber B. Parts of the boiler C, C, C, as shown detached in the several figures described above, surrounds the fire-place and coking oven. The larger portion of the boiler, or main water chamber, has a series of tubular flues D, D, passing through it, their ends being open to the fire-place A, below, and to the chimney E, above: F, is the steam chamber; G, the induction steam pipe; H, H, the cylinders of the engines, firmly bolted upon the upper part of the boiler. The ends of the piston rods have small anti-friction rollers, running between the parallel guides I, I, and are connected by slings to the crank levers K, K, mounted on the main shafts L, L, which turn in bearings supported by stretchers M, M, M, bolted to the upper part of the boiler over the coking oven. On the outer ends of the main shafts are mounted the other crank levers N, N, communicating motion through the connecting rods O, O, to the cranks P, P, fixed on the ends of the shaft or axle on which the running wheels Q, Q, are mounted. These running wheels are made fast to the ends of the tubes, or hollow axles, R, R, fitted into the crank shaft; and which hollow axles, carrying the wheels, are locked to the crank shaft by clutches Z, the axles turning between anti-friction rollers, mounted in the slings or boxes S, S, to which the carriage springs T, T, are attached; the ends of these springs are connected to the engine by the suspending rods U, U, made fast by screws and nuts to projecting parts x, x, bolted on to the sides of the boiler. The ends of the boxes s, s, are passed through staple pieces or guides Y, Y, affixed to the outer part of the boiler and steam chamber. Fig. 11, is a detached representation of the manner of suspending the carriage by the springs upon the working axle, which are so obvious as not to require further description. The fore wheels v, v, by which the carriage is steered, turn freely upon short horizontal axles, projecting at right angles from the upright rods w, w. The supply of water is placed in the tank J, under the seat of the steersman, whence it is drawn off through the pipe *a*, by the pumps *b*, and forced into the boiler. The plungers of these pumps are worked by rods *c*, *c*, connected to the crank lever K, but can be worked by hand to fill the boiler, by the lever *j*, when required. The carriage is guided in its proper track in the following manner:—The axles of the fore wheels v, v, as before stated, are arms projecting from the upright rods w, w, which rods turn in bearings at *e*, *e*, above, projecting from the seat of the conductor. The upper ends of the rods w, are attached to the levers *f*, *f*, which are connected together, being jointed to the cross bar or rod *g*; *h*, *h*, are handles upon the cross bar, by which the conductor can move the bar *g*, laterally to one side or the other, and by that means place the fore wheel in the direction required, as shown in fig. 10.

The carriage is supported upon the fore axles by the arms *i*, *i*, carrying the spring *k*, the extremities of the spring being connected by swivel pieces to the lower ends of the rods w, w. The supply of steam can at any time be cut off from the engine, by raising the end of the lever *l*, to which is connected the rod *m*, jointed to the end of the bent lever *n*, (see figs. 6, 8, 9,) which is connected by a link to the rod of the disc valves *o*, placed at the end of the induction steam pipe G. The friction band or drag *p*, is placed round the outside of the brake wheel *q*, and is tightened round it by the conductor placing his foot upon the lever *r*, and depressing it. This lever is mounted upon the cross shaft *s*, turning in bearings *t*, *t*, and has other levers *u*, *u*, mounted on its end. Rods *v*, *v*, are connected to the ends of the levers *u*, *u*, and to the cross head or bars *w*, *w*, which is jointed to the lever *x*, of the friction band, to the end of which it is attached. (See fig. 9.) Hence it will be seen that by depressing the lever *r*, the longer end of the lever *x*, will be drawn towards the front of the carriage, and the friction band or brake will be tightened upon the surface of the brake wheel, and the progress of the axles or wheels consequently be retarded.

The steam in its passage from the boiler to the cylinder, passes through the horizontal pipe or steam-way, leading to both engines: in this passage are placed two throttle valves, which are worked in the following manner:—reference being had to the several figures 12, 13, 14, 15, which are detached representations of the mechanism for working the throttle and slide valves, and stopping or changing the direction of the carriage. Fig. 12, is a plan or horizontal view; fig. 13, a side view; fig. 14, is a section in the position of fig. 13; and fig. 15, is a section of the wheel in fig. 14, taken in the direction of the axle. Round the periphery of the clutch box is formed a toothed rim 2, which takes into the toothed wheel 3, of the same diameter, mounted upon a tube 4, shown by dots fitting loosely upon the shaft 5, which is supported and held in its proper position by jointed rods 6, 6, extending from the upper side of the main axle, and from the cylinder case. The wheel 3, is locked to the shaft 5, by the clutch pins 7, 7, fixed into the sliding clutch plate 8, which is feathered to the shaft 5. The clutch pins 7, 7 pass through holes in the steady plate 9, fixed upon the shaft 5, and into holes formed in the wheel 3; by this connexion the wheel 3, and shaft 5, are made to revolve together. Convolute springs 10, 10, are placed in recesses or boxes in the wheel 3, their inner ends being attached to the wheel, and their outer ends extending in a groove 11, formed in the side of the wheel tappets 13, 13, are fastened into the circular plate 14, which is mounted upon the outer tube 15, turning upon the inner tube 4, of the wheel 3, to which tappets the outer ends of the convolute springs are attached: 16, is a friction roller on the end of the lever 17, which roller runs in the space between the wheels 3, and plate 14, upon the outer surface of the springs 10, 10; 18, is another lever at right angles with the former, also having a friction roller running upon the surface of the springs; these levers 17, and 18, turn upon the axle 20, as their fulcrum; their other ends are connected to the rods 21, 21, which are jointed to short levers 22, 22, upon the axles of the throttle valves. By these means, as the springs and tappets revolve, they alternately move the ends of the levers 17, and 18, for the purposes of opening the throttle valves, the valves being closed again by springs at the commencement of every stroke of the piston of the engine. It will be perceived that the distance that the tappets 13, and the coiled ends of the springs 10, are from each other, will determine the length of time the throttle valves remain open, and consequently the quantity of steam admitted into the cylinders; 23, 23, are tappet pieces placed on the side of the wheel 3, to raise the levers before they come into contact with the springs.

The slide valves which change the induction and eduction passages of the steam in the cylinders, are worked by the small cranks 24, 24, on the end of the shaft 5. These cranks are connected by rods, 25, 25, to the ends of right-angled levers 26, 26, turning in bearings on the rod or shaft 27, as their centres; the other ends of these levers are connected by joints to the slide valve rods 28, and consequently as the shaft 5, revolves, the steam passages are changed at the proper time.

In order to vary the power of the engine, according to the condition and inclination of the road, I regulate the supply of steam by the following contrivance:—The outer tube 15, upon which the circular plate 14, is fixed, has an oblique groove 29, cut through it, and the inner tube 4, carrying the toothed wheel 3, has a straight longitudinal groove cut along it, through which grooves a stud fixed in the collar 30, works; the collar being made to slide laterally upon the tube, by a swivel and arm 35. As this collar 30, works backward and forward, it causes the outer tube 15, with its circular plate 14, to turn part of a revolution upon the tube 4, carrying the toothed wheel 3; thereby changing the relative position of the plate 14, and consequently extending or contracting the extent of circular surface of the springs 10, on which the ends of the levers 17, and 18, run, for the purpose of giving more or less time for the steam to pass through the throttle valves, to work the pistons in the cylinders, the throttle valves being open only at the time the friction rollers at the end of the levers 17, 18, are in contact with the segmental surfaces of the springs 10, 10. The collar and pin 30, are slidden along the grooved tubes 15, by the following means:—31, is a bent lever (see figs. 6, 8, 9,) with a handle formed on its longer arm; its shorter arm being jointed to the end of the rod 32, which rod is connected to the lever 33, placed on the end of the vertical rod 34. On the lower end of this rod is placed the lever 35, (see fig. 12,) having its forked end connected to the collar 30;

by this means the person conducting the carriage can regulate the speed of its motion; the upward or downward movement of the handle 31, giving him command over the throttle valves.

In order to change the motion of the carriage, the clutch pins 7, 7, must be withdrawn from the holes in the wheel 3, and that wheel allowed to turn half a revolution, which it will do from its connexion with the wheel 2, on the axle of the running wheels. At this time the shaft 5, with the slide valves, and their cranks and rods, will remain stationary; that is, during the half revolution of the wheel 3, when the pins 7, 7, must be immediately introduced into the holes opposite to those they were formerly in, when the auxiliary shaft will be again set in motion, and the slide valves again be put in operation; the steam will therefore be let into the reverse end of the cylinder, and the carriage and engine be consequently made to work the reverse way. In order that the conductor may have the command so as to reverse the movement of the carriage, he is furnished with a handle on the bent lever 36; (see figs. 6, 8, 9,) which bent lever is jointed to the end of the rod 37, connected to a lever 38, on the end of the upright rod or shaft 39, having the clutch lever 40, fixed on its lower end, fig. 12. The forked end of this clutch lever takes into the groove of the clutch piece 8, and by these means the pins 7, 7, can be withdrawn from the holes, and again introduced to change the motion of the carriage as desired.

The several figures, 16, 17, and 18, represent different views of my improvements in the arrangement and construction of the various parts of locomotive steam-engines, intended to travel upon railroads or railways, to draw other carriages after them. Fig. 16, is a side elevation of one of these engines complete; fig. 17, is a longitudinal section, taken vertically; and fig. 18, is a plan or horizontal view of the same. It will be perceived, that the principal parts of this engine have nearly the same arrangement as the preceding, a particular description will, therefore, not be necessary, the same letters of reference being marked upon corresponding parts, as the former: A, is the fire-place or furnace; B, the ash-pit; C, C, C, the boiler surrounding the fire-place, tubular flues, and coking oven or chamber for the fuel; D, is the water reservoir, in which the force pumps are placed; E, the coking oven or fuel chamber; F, the tubular flues leading to the chimney H: the steam chamber is shown at G, and the cylinders of the engine at I, I: the bell-crank levers K, K, are connected by links and caps to the piston rods; and L, are connecting rods, communicating motion from the bell cranks to the running wheels: *a*, is the hopper for supplying fuel to the chamber; *b*, the door for supplying air to the coking oven; *c*, a door for stoking the fire; *d*, the bridge of the furnace; *e*, *e*, are the doors for cleaning the tubular flues; *f*, is the internal safety valve; *g*, the escape to the chimney; *h*, is the external safety valve; *i*, the steam gauge; *k*, the induction steam pipe, leading to the slide valve box and cylinders; *l*, the eduction steam pipe, which may lead direct to the chimney, or to one of the air condensers for obtaining distilled water, hereinafter described; *m*, the piston rods; *n*, the parallel motion or guides of the piston rods; *o*, the rods and levers for working the slide valves by tappets *p*, *p*, on the bell-crank shaft *q*; *r*, is the hand gear for working the slide valves independently of the engine; *s*, are levers and rods connected with a treadle, for changing or stopping the motion of the engine, by throwing the tappets *p*, into or out of gear with the notches in the bent rods *o*, *o*; *t*, *t*, are steam pipes, connecting the part of the boiler situate over the coking oven with the steam chamber; *u*, the springs on which the carriage is suspended; *v, v*, are brackets and stays supporting the bell-crank shaft; *w*, are the buffers, supported by metal springs *x*, and air cylinders and pistons *y*; the place for the engineer who attends the furnaces is in front of the engine at *z*.

Another modification in the construction of the framework and of the boilers of locomotive engines, expressed under the fourth head of my invention, is shown in the drawings at figs. 19, to 25, inclusive. The carriage or framework, or casing which encloses the boiler, furnace, cylinders, and other parts of the locomotive engine, is made of plates or sheets of iron, connected together by dovetailing their edges into grooved rods or bars of iron, which rods or bars form the skeleton or ribs of the carriage.

Fig. 19, represents a transverse section of one of the framing rods A: in this rod is cut one, two, three, or more longitudinal grooves *a, b, c*. The edge of the iron plate intended to be inserted into the groove is to be beaten up on the edge, or what is technically called upset, as shown at *d*. The thickened edge of the plate forming a dovetail is then inserted into the longitudinal groove in the rod or bar, as at *c, e*, after which the metal of the rod at the edges of the groove is beaten inwards as at *b, f*, which causes the plate to be held firmly in the rod, the joint, by these means, being formed by a secure dovetail. One, two, three, or more plates of metal may, in this way, be affixed by their edges to a rod or bar of metal, and a framing and case, or carriage, may be thus constructed to support and enclose the boiler, furnace, cylinders, and other parts of a locomotive engine, in the way hereinafter shown; which frame and case, so made, will be found to be light, yet extremely firm and strong.

In order to construct a boiler of very great strength and extended heating surface, with but little comparative weight of metal, suited to a locomotive engine, I form parts or the whole of the water chambers, by connecting parallel plates of thin metal at about an inch asunder; and for the purpose of giving firmness, I corrugate or indent the plates, and fasten them together by bringing the opposite elevations into contact, and by passing rivets through those elevated parts, which bind them securely. Figs. 20, and 21, exhibit small portions of a boiler so constructed. The plates A, A, are first indented by stamping any desired number of recesses or concavities in their outer surface, as shown in fig. 20, at *a, a, a.* These indentations I prefer to make in the forms of frustrums of cones, about an inch and five-eighths at their bases. The plates, when so indented, are brought together as represented in the section, fig. 21; and rivets *b, b, b,* being passed through the cones, the plates are thereby firmly connected together.

A frame and casing for a locomotive engine, constructed by dovetailing sheets of iron into rods or bars in the way described above, forms the external frame and casing of a carriage exhibited in the following figures:—fig. 22, being a longitudinal section, and fig. 23, a transverse section through the furnace, boiler, &c. taken in the direction of the dotted line A, B, in fig. 22.

In these figures, the boiler is partly constructed in the manner last described, and partly of perpendicular tubes, containing water; which tubes may, if desired, be slightly curved to allow for the expansion and contraction of the metal: *a, a, a, a,* mark those parts of the boiler which are formed of corrugated or indented plates, as described, which surround the furnace *b, b,* and ash-pit *c, c.* The perpendicular tubes *d, d, d,* are open at top and bottom, to allow the free passage of the water through them: the flames and heated vapours from the furnace play between these pipes, and the smoke passes off at the apertures *e,* into the chimney *f*. The vessel *g*, forms the head of the boiler; and *h*, is the steam chamber, from whence the steam proceeds by the pipe *i*, *i*, *i*, through the throttle valves *j*, *j*, to the working cylinders *k*, *k*, and the eduction steam escapes by the pipe *l*, *l*, and may pass through the condenser into the water tank *m*; and whatever uncondensed steam rises in the water tank, escapes off by the pipe *n*, into the chimney *f*. The axle of the hinder wheels runs between anti-friction rollers, as described in the former arrangement; and the other parts of the machinery are arranged as shown in these figures.

Another modification of the boiler is exhibited in figs. 24, and 25, in which, for the purpose of extending the heating surface, any number of perpendicular partitions may be introduced, having water chambers within, formed by parallel plates corrugated and riveted together, as described. Fig. 24, is a longitudinal section, showing the curved form of the partitions *a*, *a*, *a*; and fig. 25, is a transverse section of the same. In this modification, I do not find it necessary to employ perpendicular water pipes, as before. The steam passes into the chamber *b*, *b*, above, and from thence to the working cylinders.

My method of condensing the eduction steam of high-pressure engines by the agency of atmospheric air, is explained by the sectional figure 26, which is a diagram, illustrative of one arrangement of the condensers of locomotive engines, constituting the fifth head of my invention.

This apparatus may be adapted and placed in any convenient situation between the eduction passage and the ultimate escape into the chimney. Fig. 26, is a longitudinal section, taken vertically. The eduction steam passes from the engine through the pipe *a*, into the first refrigerating chamber A, where it is allowed to expand. This chamber has a number of small pipes *b*, *b*, extending through it horizontally, their ends being open to the atmosphere, which constantly passing through the pipes, produces refrigeration. From this chamber A, the steam proceeds upward by the pipe *d*, into the second refrigerating chamber B, which is also filled with open air tubes *c*, *c*, *c*. The steam passes up the pipe *d*, and through the lateral openings or ways *e*, *e*, *e*, *e*, then down the chamber B, circulating among the cold air tubes, where, coming in contact with the cooler surfaces of the tubes, it condenses, and the water produced by such condensation, passes from the chamber B, through the smaller pipe *f*, along the bottom of the chamber A, and off to the supply pump of the boiler, by the exit pipe *g*. The small portion of steam remaining uncondensed, escapes up the tube *h*, which is open to the atmosphere, or leads to the chimney.

If it is desired to employ the air which has become heated in its passage through this refrigerator, and conduct it into the furnace of the boiler, for the purpose of supporting combustion, it may be forced through the refrigerating pipes *b*, *b*, and *c*, *c*, by a rotatory fan, or other means, there being proper casing and passages provided to direct its course.

Fig. 27, a vertical section of a refrigerator constructed to effect this object, which is shown in the drawing under the standing place of the person who attends the furnace of the locomotive engine: *a*, is the eduction steam pipe; A, A, the refrigerating chamber through which the steam passes, making its exit at the pipe *b*. The rotatory fan *c*, is worked from the engine, or from the running wheels by bands and riggers, or by any other method, and which forces a current of air through the tubes *d*, *d*, *d*, and passage *e*, into the furnace of the engine.

The sixth head of my invention—the mode of connecting the locomotive engine with carriages to be worked on ordinary roads—is exhibited at fig. 28, which represents at A, the plan or horizontal appearance of the carriage; that is, the wheels, axletrees, perch, &c. of a locomotive engine; also at B, the wheels, axletree, perch, &c. of an ordinary vehicle, for the conveyance of goods or passengers to be impelled by the power of the locomotive engine: *a*, is the perch of the locomotive carriage; *b*, the perch of the vehicle to be impelled; *c*, *c*, *c*, is a ridged bar or rod connecting the two perches together by joints; the impelling power of the locomotive carriage A, being communicated through the rod or bar *c*, to the vehicle B, in front. The two carriages are also connected by a sliding joint *d*, formed by a pin fixed in the end of the pole *e*, of the impelling carriage, which acts in an elongated hole in the tail *f*, of the perch of the forward vehicle, for the purpose of giving direction to the force-wheels of the impelling carriage. It must be obvious from this arrangement that the course taken by the train of carriages, however many there may be attached to the locomotive carriage, will depend upon the direction of the fore-wheels of the forward vehicle, which may be turned in the ordinary way of guiding locomotive carriages.

The seventh head of these improvements consists in the employment of an additional rim or flange upon the outer edge of each of the running wheels of a locomotive railroad carriage, for the purpose of preventing the wheels from running off the rails, in the event of meeting with such an obstruction as should lift one wheel up sufficiently high to allow of its inner flange running over the rail. It will be evident, that where the running wheels have an inner flange only upon their edges, if any impediment stops the progress of one wheel, and raises its flange above the rail, the companion wheel, continuing its progress, will take a curved course and run off its line. As these observations apply to wheels of the common construction for railway locomotive engines, supposing one of the running wheels to meet with any obstruction in its progress, such as a stone, stick, or crow-bar, accidentally left on the rail, its progress would be suddenly checked, its flange rising above the rail; the other wheel not meeting with such obstruction, has a tendency to continue its course; but the interruption of its fellow-wheel, at the point of obstruction, forms a centre at the moment of its being thrown up; and the consequence is, that the non-obstructed wheel is made to take a curved direction, and the engine is caused to run out of the proper course.

The improved safety running wheels are shown at fig. 18, of the engine, constructed with the outer rims, *a, a*, as well as the ordinary inner rims *b, b*. It will be evident, that in case either of these wheels meet with any obstruction, causing it to be thrown up off the rail, its fellow-wheel would have the same tendency to run off the rail, as those of the common construction; but it is prevented from doing so by its outward flange, which keeps it in the proper course upon the rail. In order that these improved wheels, with double flanges, may be allowed to pass from one line of rails on to another, as in changing their course from a main line on to a branch railway, it becomes necessary to form the switches or guides, which direct the wheels from one line of rail to another, out of the rail itself, instead of having separate wedges or other formed pieces, as in common.

Figs. 29, and 30, will serve to illustrate the manner of effecting this object. Fig. 29, is a plan view; and fig. 30, a cross section taken vertically through the rails, and part of the ground: *a, a*, is the main or continuous line of rails; *b, b*, the branch line; *c, c*, the switches or guides, formed of part of the rail, and turning upon pins at one of their ends. Supposing an engine to be travelling in the direction of the arrows, and intended to pass along the branch way, the switches or guide pieces *c*, *c*, would be placed in the situation shown in fig. 29, that is, leading from the main line to the branch rails; but when the engine is travelling on the main line, the guides *c*, *c*, must stand in a line with it. The switches or guides *c*, *c*, are connected together by a rod *d*, *d*, extending across the underside of the rails, and furnished with a handle, by which the guides can be moved from one line to the other, simultaneously; and in order that these guides may, at all times, be in proper connexion either with one line or the other, I have shown in these figures a method of causing them always to be brought up to proper stop pieces *e*, *e*, *e*, *e*, placed at the sides of the rails. A toggle-joint lever *f*, moves on a fulcrum in the bar *g*, attached at the upper end to the cross bar *d*, the lower end being connected to the other toggle piece *h*, jointed to the end of the lever *i*, which turns in a fulcrum on the bar *j*, having the weight *k*, at its other end. By this it will be perceived that the force exerted by the weighted lever *i*, against the toggle joint piece *h*, causes it, through the lever *f*, to force the bar *d*, either one way or the other, so as to bring the guides *c*, *c*, up to the stops *e*, *e*, and thereby causing them at all times, when at rest, to coincide with one or the other of the lines of rails.

My improved manner of lubricating the rods of the pistons and pumps, forming the eighth head of my invention, is shown in fig. 31, and consists in the introduction of an annular chamber, placed within the ordinary hempen packing, into which the oil, tallow, or other lubricating material is introduced from a small reservoir placed at the side of the stuffing box. Fig. 31, is a vertical section of a stuffing box, adapted to a piston rod. Fig. 32, are side view and section of one of the annular chambers detached: *a, a,* is the chamber, the sectional form of which is triangular, the upper and lower angles being inclined, in order to cause the packing to close upon the piston rod, as the gland *b,* is screwed down to tighten the packing; *c,* is a small reservoir for the lubricating material, screwed into the stuffing box *d.* The oil or other material passes from the reservoir through the cock and pipe *e,* into an annular recess *f,* formed on the outside of the ring, from whence it flows through holes to the interior of the ring, when it comes in contact with the piston rod, or other surface to be lubricated.

The sectional figs. 33, and 34, will illustrate the subject of the ninth head of these improvements, viz. the safety plate and fire extinguisher: *a,* is a pipe leading from the boiler or steam chamber into the tube or chamber *b*; the lower portion *c,* of which tube is open, and is fixed immediately over the furnace or fire-place, or other convenient situation. A thin metallic plate *d,* forms a partition between the chambers *b,* and *c,* and which is intended to burst at a pressure a little greater than that at which the boiler is designed to be worked. The strength of this plate is regulated by the degree of pressure to which it is desired to raise the steam: *e,* is a rod connected at one end to the cross pieces *f, f,* and at the other end to the conical piece *g,* which is held up by the metallic plate *d.* In case the steam in the boiler should rise beyond the proper pressure, the plate *d,* will give way and burst downwards, when the force of the water rushing from the boiler, will cause the cone and rod *e,* to descend until the cross pieces *f,* are stopped by the projecting inner flange *h, h,* of the lower chamber *c,* as seen in fig. 34, when the cone *g,* will be suspended opposite the aperture of the chamber *c,* and the water will be directed by it in a spray over the ignited fuel in the furnace below.

Fig. 35, represents the subject of the tenth head of these improvements, showing an auxiliary to an ordinary railway, by means of which inclined planes of considerable acclivity may be ascended by locomotive engines without the assistance of additional power, and is a side elevation of a locomotive engine and train of carriages running up an inclined plain: A, A, are the lines of the ordinary iron rails; B, B, the running wheels of the engine; C, C, raised tracks or ways erected on the sides of the road, which are much broader than the ordinary rails, and may be formed of stone or any suitable material; D, D, are broad rims affixed to the outer sides of the running wheels, or upon the same shaft or axis as the running wheels. These smaller wheels run upon the surface of the raised tracks, and by their being of smaller diameter, they enable the engines to ascend the incline with less difficulty, and without changing their speed of working: and if it should be thought desirable, the smaller wheels may be formed with a rim of cogs or teeth, taking into a rack fixed upon the raised tracks, but allowing the periphery of the smaller wheels to run upon the surface of the stone or iron work. The lower ends of the tracks or ways are formed with inclines as at E, E, so that the smaller wheels meet with the tracks, and raise the larger running wheels off the rails without any sudden jerk, and also leave the upper end of the tracks by other inclined planes, which let the larger running wheels gently down upon the iron rails, when the engine has passed up the incline.—[*Inrolled in the Rolls Chapel Office, September,* 1835.]

Specification drawn by Messrs. Newton and Berry.

To JAMES MARTIN, *of Charing Cross, in the parish of St. Martin in the Fields, and city of Westminster, gentleman, for an improvement in dissolving and preparing caoutchouc or India rubber, to render it applicable to various useful purposes, being a communication from a foreigner residing abroad.*—[Sealed 27th February, 1836.]

THE object proposed under this patent, is to produce an olefiant or etherial essence for the purpose of dissolving caoutchouc or Indian rubber; and which said solution of caoutchouc, when so made, is much more perfectly and speedily returned to its natural and original state, for all purposes to which it is to be applied, than has been heretofore effected by any other menstruum.

To make the olefiant or etherial essence, I put into a boiler three or four hundred gallons of water to be converted into steam: this vapour or steam is conducted into an alembic, into which I have previously put fifty gallons of water, mixed with fifteen or more pounds of the concentrated sulphuric acid of commerce, commonly called oil of vitriol. When the said acid is well combined by stirring, I put three hundred gallons of rough or brown volatile oil or spirit, whether vegetable, mineral, or animal, so that the acid is in the ratio of five per cent. to the volatile or rough oil or spirit; I then let on the steam from the boiler, which being conducted by the retort pipe to near the bottom of the alembic, speedily imparts its caloric, and raises it to the boiling temperature, and distils over the more volatile or etherial parts of the rough oil or spirit, and which is condensed in the worm or serpent, and obtained mixed with the condensed water in the receiver.

Now it is not my intention to confine myself to any given quantity of sulphuric acid, such as five per cent., but I claim the carbonizing property of sulphuric acid, used in such proportions as may be necessary or required by the original quality of the rough oil or spirit, or as may be demanded by the degree or specific lightness of the olefiant or etherial essence, which may be required for the different qualities of the caoutchouc or Indian rubber that may be employed, and which will vary according to the application or the nature of the combination desired. As for example, when a very etherial and speedy solvent of the caoutchouc or Indian rubber is required, I put ten per cent. of sulphuric acid; in which case, however, I shall diminish the quantity of etherial essence, but shall materially augment its volatility and diminish its specific gravity.

When the running of essence from the condenser is become so trifling as to be only one-tenth of the water condensed, I stop the entrance of steam, and draw off the water and decomposed oil or spirit, which latter I return into the rough or crude tar still, which adds to the quantity, and improves the quality of the pitch; or, I convert the said matter into a varnish by evaporation, and the addition of a tenth part of black or common rosin.

The boiler is to be made of plate or wrought iron, the alembic is of lead; the neck or retort of the iron boiler is of sheet iron, strong enough to resist the pressure of about one atmosphere and a half, or twenty-six pounds on the square inch; the neck or retort of the leaden boiler is to be of lead, and the worm spiral, or serpent of block tin soldered together, and varnished with any good insoluble varnish.

When the day's work is finished, I stop or close up the lower end of the said serpent with a wooden plug, so as to hinder the air from passing through the apparatus, which prevents the decomposition of the iron, lead, or tin on the inside.

The worm or serpent must be supported upon a frame inclined at the angle of 45 deg., and be kept down by leaden or iron weights. I apply the usual safety valve to the steam boiler, and also an inward valve or a vacuum valve to prevent the collapsing of the leaden still or alembic from the outward or external pressure of the atmosphere upon it, and so as to allow the atmospheric air to enter the still or alembic; should the steam be allowed to cease suddenly, or any other cause produce a vacuum within the said still, such a valve is also applied to the iron boiler.

It will be a measure of prudence to surround the leaden still or alembic with a casing of iron, hooped wood, or other material, which would protect the lead from inward pressure, and also from any external violence or accident. It would also prevent the said still from losing caloric or heat by radiation.

I construct my steam boiler rather larger than is absolutely necessary, as when the steam is abundant, I can work off the olefiant or etherial essence several times each day, should I require it; but I do not intend or mean to confine myself to any precise forms, capacity, or materials. But I claim as my invention, every mode and variation which can effect the said decomposition or carbonization of rough mineral, vegetable, or animal oil or spirit, by sulphuric acid, whereby to produce an olefiant or etherial essence, much more volatile and efficacious than can be produced by any former or known means hitherto employed; and which said olefiant or etherial essence is eminently valuable for the said purpose of dissolving caoutchouc or Indian rubber, and permitting it to return to its natural and original state, in a more perfect manner than hitherto, and without leaving behind it any trace of the aroma, odour, or smell of the menstruum used, and which is so desirable in the manufacture of impermeable or waterproof materials, whether for articles of dress, or any other employment.

Having thus described the nature of this invention, and the manner I have pursued to carry the same into effect, I would wish it to be understood, that I claim under this patent the olefiant or etherial essence so produced, as a menstruum or solvent for caoutchouc or Indian rubber.—[*Inrolled in the Rolls Chapel Office, August,* 1836.]

Specification drawn by Messrs. Newton and Berry.

To JOHN STREETS, *the younger, lace manufacturer, and* THOMAS WHITELEY, *mechanic, both of Nottingham, for their invention of certain improvements applicable to that class of machinery commonly called or known by the name of warp machinery, employed in the manufacturing of lace and other fabrics.*—[Sealed 22d January, 1835.]

THE Patentees premise that the construction of the warp machinery, as applied to the making of lace, is well understood by a certain class of workmen; but notwithstanding this, they have devoted a very large portion of their specification to an explanation of the details of that kind of machinery, and the manner in which the warp threads are lapped over two or more of the bearded needles, in order to cause the threads (which would otherwise produce knitting or stocking fabric), by lateral movements, to form the holes r open meshes of lace fabric. They have also set out the manner in which, by omitting certain needles in the range, the fabric is made into several narrow strips of lace called tattings, the strips being connected together in one broad sheet by single lacing threads, instead of one uniform sheet of net being produced of the whole width of the machine. Likewise the manner of communicating thick threads, called gimp threads, is described, and of working them into the fabric by means of additional thread guides for embroidering the lace. And lastly, the manner of producing eyelet holes in different parts of the net is explained, viz. by the employment of several extra guide bars, each of which are distinctly operated upon by the cams or shogging wheels, for the purpose of withholding certain of the threads, and thereby producing the open spaces called eyelet holes in the fabric.

All these matters being common and well understood parts of, or appendages to, the warp frame, it appears to be rather a gratuitous surplusage in the Patentee to have indulged us with one of those elaborate essays, accompanied by a long series of sheets of drawings, which have so often of late been brought forth upon the rolls of patent for the enlightenment of the lace trade. We, however, confined within the narrow bounds of a monthly publication (at present oppressed by the extensive demands of other subjects), are constrained to limit our report to the real matters of the invention, consisting simply in three particulars, and which are almost as fully explained by the concluding clause of the specification, as by the details in the body of that deed.

First, the Patentees claim the adaptation to a warp machine for making lace, of a row of parts called thread conductors, formed as the teeth of a comb, which are interposed between the ends of the needles and the ends of the guides, in order to act as a slea for conducting the warp threads into the proper places between the needles, instead of requiring the guides to pass between the needles. Second, these thread conductors are made with some long and some short stems, for the purpose of gathering certain of the warp threads, and confining them between the stems, so as occasionally to withdraw threads from particular needles, in order to leave open spaces as eyelet holes in the fabric. Third, in a row of parts called pressers, formed by stems with bent prongs at their ends, which are occasionally to act as substitutes for the ordinary presser bar, for the purpose of landing the loops and stitches over the beards of the needles when the newly-formed lops of thread are beneath the beards.

The object of the improvements, as adapted to warp machinery, being thus stated, it is only necessary for us to add, that these thread conductors and pressing prongs are fixed in leads in the same way as the needles and guides, that they are mounted on bars extending across the machine, and that they are at stated periods made to operate by means of levers and cams acting upon them; the whole of the machinery being put in operation by a rotary shaft, driven either by manual labour or by mechanical power.—[*Inrolled in the Rolls Chapel Office, July*, 1835.]

To **Henry Dunington**, *of Nottingham, and* **William Copestake**, *of Stapleford, both in the county of Notts, lace manufacturers, for their invention of certain improvements in making or manufacturing lace.*—[Sealed 13th May, 1835.]

This invention, stated to be improvements in making lace, is, in fact, only some mechanical agents to be applied to that description of machine called the warp frame for making lace. The machine is to be driven by rotary power, instead of being actuated by hand, as is usually the case; and as the fabric to be produced is delicate, and apt to rend if any extraordinary or unequal force should by accident be exerted upon it, the Patentees propose to drive it by the contact of friction surfaces instead of toothed gear, in order that the coupling or connecting parts may give way whenever an unusual strain happens, from any slight derangement of the machine, or from other causes.

The driving power is applied to a horizontal shaft in the back part of the machine, carrying cams, as in Herbert's rotary warp machine. Vol. iii. of our present Series, page 213, and Plate XI., which plate will sufficiently apply to the present invention, so far as to exhibit the warp machine driven by rotary power.

The coupling clutch for driving is formed by two wooden cones, one within the other, which adhere by the friction of their surfaces; the one cone being connected to the driving rigger or strap pulley, the other to the driving shaft of the machine; and hence if any unusual resistance occurs in the movements of the machinery, the inner cone will slip within the outer one.

The second improvement is the employment of a worm or endless screw, in connexion with the back shaft, which worm is acted upon by a spur wheel, and is designed for driving the machinery slowly, instead of working the shaft rapidly by an ordinary wheel and pinion.

The third improvement is the adaptation of such a cam wheel in connexion with the back shaft of the warp frame, as shall cause three evolutions of the machinery to be performed for every rotation of the back shaft.

The claims of novelty are, first, the peculiar construction of a conical friction clutch to a warp machine for making lace; second, the mode of actuating the machinery through the agency of an endless screw; and, third, the three-step cam wheel for giving three distinct series of evolutions by one rotation.—[*Inrolled in the Inrolment Office, November,* 1835.]

To HENRY DUNINGTON, *of Nottingham, lace manufacturer, for his invention of certain improvements in making or manufacturing lace.*—[Sealed 22nd June, 1836.]

THIS invention is an improvement upon the third feature of the foregoing patent. In the former instance, three series of evolution of the machinery were to be made by every rotation of the back shaft; it is now proposed to produce four series of evolutions by every rotation of the back shaft, which, it is said, will cause the machinery to move with greater steadiness.

The construction of the machine called the warp frame being well understood, the Patentee has only thought it necessary to represent in a sheet of drawings diagrams of the external forms of the several cams he employs, technically called the cut of wheels; these are to be affixed to the back shaft of the machine, for the purpose of working the several levers and bars. No further description of the machine is given.—[*Inrolled in the Inrolment Office, December*, 1886.]

To Claude Guilotte, *of Crispin-street, Spitalfields, in the county of Middlesex, machine-maker, in consequence of a communication made to him by a foreigner residing abroad, for an improvement in the rack applicable to the battens of looms, or machinery for weaving plain or figured ribbons.*—[Sealed 11th February, 1831.]

This improvement applies solely to that construction of loom called the French ribbon loom, in which a series of small shuttles are driven to and fro through the narrow warps of the ribbons, by means of a sliding rack.

The Patentee says, these French ribbon looms are very well known in England, but in order to render the improvement evident, he has thought it necessary to describe their construction.

The narrow warps of the several ribbons intended to be woven are extended horizontally from the warp beam through corresponding narrow portions of reed to the work beam, and a distinct shuttle is employed to weave each ribbon, which severally move to and fro through their respective warps by sliding in grooves in the front of the batten.

The shuttles have each a small rack on their under side, which being acted upon by small pinions mounted in the batten, are, by the reciprocating rotary motion of these pinions, made to move to and fro in their respective races in the batten through the warps, for the purpose of effecting the intervention of the threads or weaving;

and the pinions are actuated by a rack which slides to and fro under them. This rack receives its sliding motions from a toothed wheel mounted in the batten, the axle of which wheel has a reciprocating motion communicated to it by straps from the treadle levers.

The rack which drives the pinions, and those in the under sides of the shuttles, if formed of metal, require grease or other anti-attricious matter to relieve the friction; and this grease coming by accident upon the goods while manufacturing, is found to be very injurious. It is therefore proposed to form these racks of leather instead of metal, which substitution of leather for metal constitutes the whole subject of the present invention.

The racks are to be cut out of strips of thick sole leather, and to be glued on to a lath of mahogany, which is to be made stiff by pinning to a slight bar of metal.—[*Inrolled in the Inrolment Office, August,* 1831.]

To WILLIAM MASON, *of Brecknock-terrace, Camden-town, in the county of Middlesex, engineer, for his invention of improvements in the manufacture of steam-engine cylinders, pistons, bearings, pumps, and cocks.* —[Sealed 6th August, 1835.]

THE subject of this patent is a mode of carbonating and hardening or steeling the working surfaces of the several iron articles mentioned above, after they have been turned to their true form or figures, in order that such surfaces may better endure the wear produced by the friction of the parts against each other.

The Patentee says, that for the purpose of hardening the internal surface of the cylinder of a steam-engine or air-pump he should proceed in the following way:—

Taking the article in its rough state from the casting, he would first anneal it in a reverberatory or other suitable furnace, in which the temperature of the metal is to be raised to a red heat, and then, by extinguishing the fire, allow the metal to cool gradually. This being done, the internal or working surface of the cylinder is to be bored to its true figure. It is not, however, absolutely necessary to anneal it in the first instance, that is done for the purpose of allowing it to warp previously to its being bored, and to render the metal soft and more easily cut by the boring tool.

The cylinder of the engine or pump having been thus prepared, is to have a cylindrical core of cast iron placed within it, leaving a space of three or four inches all round, which is to be filled up with pulverised animal charcoal, or of ground bones capable of becoming charcoal; the ends of the cylinder is then to be closed and luted up with clay, or other material, for the purpose of securing the charcoal from evaporation, or from the admission of air.

Thus prepared, the cylinder is to be placed in a furnace, and its temperature raised until the metal assumes the appearance of a cherry red. This heat is to be continued acting upon the metal and carbon for the space of four or five hours, by which time the process of carbonating will have become sufficiently effected. The cylinder must then be withdrawn from the furnace, and quickly let down into a pit of water, which must cover it completely, and there it must remain until cold. The Patentee prefers that a small quantity of salt should be put into the pit of water before the metal is immersed into it.

The carbonating process having been thus performed, the core and the charcoal is to be withdrawn from the cylinder, and its internal surface having become case-hardened, any irregularities in the surface are to be removed by grinding with emery.

Pistons of steam-engines, if not greater than six inches in diameter, may be cast solid or made of wrought iron, and turned nearly to fit the interiors of their cylinders; they are then to be enclosed in animal charcoal, in a suitable receptacle, and submitted to the action of the fire and water, in the same way as described above. In the event of the pistons being of larger diameters, and made of segments and wedges, as Barton's patent pistons (Barton's metallic packing for pistons, the Patentee means), the segments are to be placed in suitable receptacles, and treated in like manner.

The same mode of hardening the working surfaces of bearings for steam-engines, of the barrels of pumps, and of the cylindrical or flat surfaces of turning or sliding cocks for such engines, is proposed, as forming several heads of the invention.

In conclusion, the Patentee states, that the manner of forming or constructing the various parts of a steam-engine, constitute no part of his invention; nor does he claim "the process of carbonating and hardening cast and wrought iron generally, but only when applied to the purposes herein set forth; and it should be understood that although I have mentioned four or five hours for the process of carbonating the surface to be so treated, yet I do not confine myself thereto, as it will be evident that, should the said process be carried on for a less time, the carbonating effect would be only less deep or extensive, which, under some circumstances, may be desirable; and by carrying on the process for a longer time, then it will penetrate more deeply: this must depend upon the workmen and on the object to be effected. But I do hereby declare my invention to consist in carbonating and hardening the working surfaces of steam-engine cylinders, pistons, bearings, pumps, and cocks, as above described."—[*Inrolled in the Inrolment Office, February*, 1836.]

To William Mason, *of Brecknock-terrace, Camden-town, in the county of Middlesex, engineer, for his invention of improvements in the manufacture of fire arms and artillery.*—[Sealed 6th August, 1835.]

This, like the preceding, is a mode of steeling or case-hardening the surfaces of iron after it has been brought by boring, or otherwise, to its true figure. The present patent is for the exclusive application of the process to the internal surface of gun-barrels, pistols, and other fire-arms, and also to cannon.

The article is to be prepared, first, by casting or welding, and then, after annealing, boring its internal surface; and if for fowling-pieces, or pistols, its external surface may be finished also: then it is to be filled with bone-dust or animal charcoal, and properly luted up air-tight; and for case-hardening the outside, it must be enclosed with the carbonaceous material in a close vessel. It is then to be introduced into a furnace, and kept for some hours at a cherry red heat, and when withdrawn, is to be let down suddenly into a reservoir of salt water.

Other parts of fire-arms, as the ramrods, may be treated in the same manner; but the process is not claimed generally for hardening, but only in its particular application to fire-arms, as described.—[*Inrolled in the Inrolment Office, February*, 1836.]

To William Southwood Stocker, *of Birmingham, in the county of Warwick, merchant, for his invention of improvements in machinery applicable to the making of nails and other purposes.*—[Sealed 7th July, 1836.]

This is a machine, which we should have supposed to have been of American origin, as it possesses the same sort of features as the old American machinery of Perkins and Dyer, at the Britannia Nail-works, Birmingham, and all the other American machines which have subsequently come under our observation, for pressing metal into the forms of nails, pins, screw shafts, rivets, &c., (see the specifications of* Tyndall's, *a*; Wright's, *b*; Hancorn's, *c*; Church's, *d*; Berry's *e*; &c.), having, if we may use the expression, a family likeness; the pressers or hammers for squeezing the rods of metal, and forming the shafts, being all worked by a rotary action; and the cutters, for separating the lengths, as well as the dies, for forming the heads by compression, are, in every case, actuated by revolving cams or cranks.

The invention before us is intended to effect the same sorts of operations by machinery, as are usually performed by the hands of a nail-maker with a hammer and anvil, viz. the shaping of the nail from a heated rod of iron, cutting it off at the proper length, and then compressing the end of the metal into the form of a head.

The machine may be considered to consist of two parts, but connected together in the same frame; the one for shaping the shaft of the nail, the other for cutting it off and heading it. A strong table, it may be called, constitutes the frame which supports the machinery. Two pairs of hammers, formed as levers, the one pair approaching each other by horizontal movements, the other pair by vertical movements, are the implements by which a portion of the end of a red-hot rod of iron is beaten or pressed into the wedge-like shape of the shaft of a nail. When this has been done, the rod, still in the heated state, is withdrawn from the beaters, and placed in the other part of the machine, consisting of a pair of jaws like those of a vice, which pinch the shaft of the nail and hold it fast. A cutter then, on the side of a wheel, comes round, and acting as the moving chap of a pair of shears, cuts the nail off from the rod. The nail shaft is still firmly held in the jaws of the vice, a portion of its end projecting out, when the heading die is slidden laterally, until it comes opposite to the end of the nail. The die is then projected forward with great force, for the purpose of, what is termed, upsetting the metal at the projecting end of the nail, and thereby forming the head.

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* *a*, Tyndall's, vol. iii. p. 184, "London Journal of Arts," Second Series; *b*, Wright's, vol. v. p. 312, ditto; *c*, Hancorn's, vol. ix. p. 135, ditto; *d*, Church's, vol. ii. p. 321, "Journal and Repertory," Conjoined Series; *e*, Berry's, vol. ix. p. 20, ditto.

The Patentee says, that the machinery may be greatly varied in its construction; and its magnitude and strength must be according to the size of the nail to be produced. Not intending, therefore, to confine himself (if we understand the words of the specification) to any particular forms of arrangement or dimensions, he states, that " by way of example," he exhibits a machine capable of performing the work in which the parts above-described are combined, the several figures of which occupy three large sheets of drawing.

A main shaft, actuated by a band and rigger, as it revolves, brings a cam into operation upon a lever which carries a double inclined plane or wedge in its front or acting part. This wedge being, by the rotary cam, projected forward between the tails of one of the pairs of hammers, causes the faces of these hammers to approach each other, and to beat or press the red-hot rod of iron introduced between them, so as to flatten it on two opposite sides. The rotary cam passing round, the wedge lever is released, and springs instantly throw back the hammers: when another cam and wedge lever brings the second pair of hammers to act upon the other two sides of the nail in a similar way. This is repeated several times, until the end of the red-hot rod, gradually advanced by the hands of the workman, has assumed the desired form, that is, the bevel and point of the intended nail.

The rod is then withdrawn from between the hammers, and, in its heated state, is introduced between the jaws of the holders for cutting off and heading the nail. A bevel pinion, on the end of the main shaft, takes into and drives a wheel upon a transverse shaft, which carries a cam, that works the levers of the holding jaws.

The end of the rod being so held in the jaws or vice, a cutter at the side of a wheel on the transverse shaft as it revolves, separates the nail from the end of the rod, leaving the nail firmly held by the jaws. The heading die is now, by means of a cam, slidden laterally opposite to the end of the nail in the holding jaws, and another cam on the main shaft forces the die forward, which compresses the end of the nail, and spreads out the metal into the form of a head.

As the main shaft continues revolving, the cams pass away, and allow the spring to throw the jaws of the vice open, when the nail falls out; but to guard against the event of the nail sticking in the jaws, a picker is provided, which pushes the rail out when finished.

In order to produce round shafts, as for screw blanks, or bolts, and rivets, the faces of the hammers must be made with suitable concavities, and the dies for heading also.

A second "example" of a manner in which the above-described machinery may be worked principally by cranks and rods, instead of rotary cam shafts and levers, occupies three other sheets of drawing; and the description of its operation is repeated nearly verbatim. A third "example" is shown in a seventh sheet of drawing, in which the hammers and other moving parts are mounted and imbedded in sockets or recesses formed in blocks of cast iron, the operation of the machinery being nearly the same as above-described.—[*Inrolled in the Rolls Chapel Office, January,* 1837.]

To RICHARD WOOD, *late of New York, in the United States of America, but now residing in Bishopsgate-street Within, in the city of London, (being one of the people called Quakers,) for his having invented an inking apparatus to be used with certain descriptions of printing presses.*—[Sealed 24th May, 1831.]

THIS improved apparatus for inking a form of types in a printing machine, consists of a certain arrangement of cylindrical rollers connected to levers, which, by means of rotary mechanism, are made to receive the required supply of ink from an ink-trough, to distribute it uniformly upon the periphery of the inking roller, and to carry that roller to and fro over the face of the flat form of types, for the purpose of giving the requisite quantity of ink for every impression.

There is some peculiarity in the way in which these rollers are mounted and made to work, but which does not appear to present any sort of advantage over the ordinary modes, nor is it by any means so simple.

The apparatus being affixed to a printing press of any of the ordinary constructions having a flat table, a winch is to be turned, which, by means of a shaft and toothed wheels, causes the ductor roller to rise and fall upon vibrating arms, for the purpose of communicating the ink from the trough to the distributing roller. This last-mentioned roller has a lateral movement, as well as a rotary action, produced by a screw-thread upon the end of its axle, acted upon by a tooth, in the same way as in many of the printing machines in common use; which lateral movement is for the purpose of spreading the ink upon the inking roller uniformly, and not allowing it to lay in bands of different thicknesses. The axle of the inking roller is mounted in vibrating arms or long levers, which are, by rods and cranks connected to a fly-wheel, made to carry the roller to and fro over the face of the types, in order to ink them.

This construction of inking apparatus, it will be perceived, has considerable complication, to explain which fully several figures of drawing would be required; we do not, however, think the subject deserving of that attention from us, as the only feature proposed as new, is the general arrangement of the whole; the parts being all well known, and have long been in use for the same purpose.—[*Inrolled in the Inrolment Office, September,* 1831.]

AMENDMENT OF THE LAWS RELATING TO PATENTS FOR INVENTIONS.

Another bill for amending the Patent Laws has been introduced into the House of Commons by Mr. Mackinnon, M.P. for Lymington, and Mr. Baines, M.P. for Leeds. The present bill is in all its features different from that which was presented to the House last sessions by Mr. Mackinnon; and if we are to form any judgment from the speech of the hon. member in introducing it, as reported in several of the newspapers, we should conceive that he is very little better informed as to the real defects of the laws and practice regarding patents than he appeared to be on the former occasion.

The bill comprehends twenty-nine clauses, which are much too voluminous and extensive in their range of subject for us to discuss the merits of upon the present occasion. We shall therefore merely state the leading features of the proposed law, leaving our readers to digest the bill itself, and conclude with a few remarks upon its general bearings.

The first eight clauses of the bill are for the constitution of a new court or Board of Commissioners of Patents, and the regulations by which they are to discharge the duties of the office in place of the Attorney and Solicitor-General, who are to be superseded, and their part in the business of granting patents to be transferred to the new Commissioners. The ninth clause directs the new routine of granting patents, or rather the ordeal through which Patentees and their Agents will have to pass in soliciting a patent. The tenth, eleventh, and twelfth clauses repeal those parts of the late Act which allowed disclaimers of any portions of the title or specification of a patent, subject to the approval of the Attorney or Solicitor-General, and transfers the same powers under similar regulations to the new Commissioners.

The thirteenth clause reduces the stamp duty upon a patent to 10*l.*; the fourteenth gives the date of the patent from the filing of the petition; and the fifteenth extends the patent right, if desired, over Great Britain, Ireland, and the colonies.

The sixteenth to the twentieth clauses inclusive, are for the purpose of protecting new designs and patterns in works of art from piracy for one year, and for granting protecting licenses for that purpose.

The twenty-first clause abolishes all fees heretofore paid at the public offices in soliciting patents; the twenty-second empowers the Secretary of the Commissioners to receive all fees in future payable for such grants; the twenty-third directs the payment of salaries to the Commissioners, Secretary, Assistant-Secretary, Registrar, Deputy Registrar, Clerk, Messengers, and all other officers or servants out of the funds produced byt he above payments of fees; and the twenty-fourth fixes a penalty upon any such official person who shall act directly or indirectly as a patent agent, that in the procuring, maintaining or opposing of letters patent, under a penalty of 50*l.* and expulsion from the office. This is very proper, and would remove a very serious evil which at present exists.

The twenty-fifth clause empowers the Commissioners to issue general orders and settle all extra fees, which are to be approved by the Lord Chancellor; the twenty-sixth allows compensation to all persons who shall be injured by the operation of this Act; the twenty-seventh directs that all surplus monies remaining after the satisfaction of these demands, shall be carried to the Consolidated Fund; the twenty-eighth allows this Act to be altered during the present session; and the twenty-ninth, that the powers and provisions of the Act shall come into force on the 1st January, 1838.

HOUSE OF COMMONS.

"Mr. Mackinnon moved for leave to bring in a bill to alter and amend the Patent Laws, and for better securing to individuals the benefit of their inventions. In making this motion, the hon. member urged upon the consideration of the house the importance in a commercial and manufacturing country, of stimulating ingenious and enterprising men to devote their minds to improved means of practising the useful arts, and of otherwise promoting social advancement by their inventions. It was scarcely necessary for him to suggest, that facilitating the acquisition of patents was amongst the most effective modes of advancing the best interests of society. He admitted, that notwithstanding the imperfect condition of the law of patents, there had been a vast accumulation of ingenious inventions; but he desired to know why any penalty or inconvenience should attach to the acquisition of a patent beyond what was barely necessary, especially in a country, the prosperity of which so materially depended upon the encouragement of ingenuity and enterprise. Some years ago it was said, that the weight of the public debt would, for a long time to come, so oppress the energies of England, that she could never again hope to see prosperous days. We now owed 800,000,000*l.* of debt, yet we were prosperous, and why? It was surely no sudden improvement of our soil, no unexpected acquisition of territory. It was chiefly effected through the wonderful improvements which had been made in our manufactures; and if the Legislature denied that facility to the takiug out of patents which clearly ought not to be denied, they must abandon the hope of that further extension of improvements, by which alone our commercial and manufacturing eminence could be maintained at its present level. There was no express statute according to which patents might be granted—he meant that the granting of them did not rest upon a foundation of statute law, for the statute of James I. merely went to enable the King to relax existing monopolies, and to grant certain privileges for twenty-one years. The hon. member then complained of the expense which attended the taking out of patents, and proceeded to observe, that when an individual wanted to protect any right to which his inventions fairly entitled him, it was necessary that he should present a petition, setting forth that the invention was his own; it then became requisite that he should obtain a warrant under the King's sign manual; and to get this, he had frequently to go about from office to office, and be exposed to a vast amount of trouble for a period varying from six to eight months; and before he could extend his patent rights to Great Britain, Ireland, and the colonies, he must be at an expense of from 350*l.* to 360*l.* It was really very hard that a public benefactor, for inventors of the class to whom he referred were public benefactors, should have for so long a time to dance attendance after the Attorney-General, a public functionary who, besides his other official duties, had his attention distracted by the claims of his clients, of his constituents, and of his duties in the House of Commons. The change which he proposed to introduce would embrace the appointment of three Commissioners by the Crown, with power to receive, consider, and decide upon petitions for patents to be granted with the King's sign manual, those commissioners having power to make, with the sanction of the Lord Chancellor, such by-laws relative to expediting the grant of such patents as from time to time they might see necessary. The hon. gentleman then read an extract from the evidence given by Mr. John Smith, a Sheffield manufacturer, before the committee on arts and manufactures, in which the system of piracy practiced by certain individuals connected with the Sheffield trade was strongly reprobated, and in which it was further alleged that the manufacturers must give up their patents altogether, unless legislative protection be extended to them. The hon. gentleman next adverted to the very large expense which persons obtaining a patent under the present system incurred, amounting to a sum which varied from 300*l.* to 400*l.*; and proposed fixing the total amount to be charged to individuals hereafter obtaining patents at a *maximum* (as we understood) of 200*l.* He also proposed that the same gentleman, in whom would be vested the power of conceding patents, should be also commissioners for granting licenses to persons who were the inventors of original designs, models, drawings, and casts; and that they should have the power of opening a gallery, in which such designs, models, &c., should be exhibited to the public; that a certain sum (say 1s. or more) should be charged to the public for liberty to inspect the contents of this gallery; and that the individuals applying for such license be liable to an expense of from 8*l.* to 10*l.* for registering such designs, casts, and drawings. Upon the registry being made, and the specified sum paid by the applicant for a license, he proposed that a certificate should be given to the party by the commissioners, by virtue of which he would, for twelve calendar months, enjoy the exclusive right of vending the article, and obtain the benefit of a whole season in London. He (Mr. Mackinnon) was of opinion that the result of his plan would be the accession of a considerable revenue to the State, as the number of patents and licenses must, in his estimation, increase in a very considerable ratio to the reduction of the expense. His plan comprised a fair amount of compensation to those who now derived fees from the business of registering patents. In estimating the probable effect which the proposed change would produce upon the revenue, he would observe that, taking an average of the last ten years, the annual amount of stamp and other duties collected under this head of revenue was about 9,950*l.* Assuming that it was 10,000*l.*, and that the perquisites derived by various persons from the business connected with licenses was 20,000*l.* per annum, the sum of 30,000*l.* per annum would, therefore, repay both the Chancellor of the Exchequer and the individuals entitled to compensation. Now, the commissioners, under the new arrangement, would, he felt quite convinced, receive a much larger sum than 30,000*l.* a-year —a sum little short, he believed, of 120,000*l.* per annum. Assuming the whole expense to be incurred under the proposed arrangement to be 4,000*l.* per annum, which, in addition to the 30,000*l.* to which he had before alluded, would cover the entire expense of fees and stipends paid to commissioners, clerks, and secretaries, a clear accession of revenue would remain behind to the amount of 80,000*l.* per annum. The hon. gentleman concluded by moving for leave to bring in a bill in the terms before specified.

"The Attorney-General said, that he by no means rose for the purpose of opposing the bill of which the hon. gentleman had given the outline. He felt the importance of the subject; and considered it most desirable that the inventors of useful designs in connexion with the arts and manufactures should reap the full benefit of their discoveries. It was necessary, however, to remind the house, that a committee had for some time past been sitting upon this very subject, which was presided over by his hon. friend, the member for Chester. It might be well worthy of consideration whether, without involving themselves in an expensive change, the machinery now in existence might not be modified, so as to become perfectly efficient. He should feel most anxious to promote any reasonable amelioration in this department; and would, with the utmost candour, examine the details of the hon. member's bill. He could hardly, however, reckon upon giving to it his unqualified support.

"Dr. Bowring thought that the hon. gentleman upon the *other* side of the house (Mr. Mackinnon) had adopted a principle which was decidedly erroneous. His project was of too expensive a nature. If patents were to be conceded by law at all, they ought to be made cheaply obtainable. They should be either altogether done away with, or should be conceded upon the most economical terms. He considered 200*l.* too much for a patent, and 10*l.* too much, in proportion, for a certificate of license. The present machinery was not only exceedingly objectionable, on the score of its being of too expensive a nature, but also on the ground of its management being exceedingly tardy. Altogether, he felt thankful to the hon. gentleman for having called the attention of the house to the subject.

"Mr. Ewart was of opinion that the proposed machinery was of too expensive a nature.

"Leave was then given to bring in a bill.—(*Times.*)

A BILL

TO AMEND THE PRACTICE RELATING TO LETTERS PATENT FOR INVENTIONS, AND FOR THE BETTER ENCOURAGEMENT OF THE ARTS AND MANUFACTURES.

I. *Appointment of Board of Commissioners to carry this Act into execution.—Commissioners to be appointed during good behaviour.*

Whereas it is expedient to amend and simplify the practice now in use, relating to Letters Patent for Inventions; be it therefore enacted, by the King's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, that it shall be lawful for his Majesty, his heirs and successors, by Charter or Letters Patent under the Great Seal of the United Kingdom of Great Britain and Ireland, to erect and establish a Board of Commissioners to carry this Act into execution; and by commission under the Great Seal to appoint *one* person to be the chief of such commissioners, and *two* other fit and proper persons to be other commissioners of the said board, and from time to time to supply any vacancy in the number of the said commissioners; and that until such vacancy shall be supplied, it shall be lawful for the surviving commissioners to act as if no such vacancy had occurred; and that the said commissioners shall hold their said offices during their good behaviour, and so long as they shall personally give their attendance upon their respective duties, and shall conduct themselves honestly and faithfully, in the due execution of the duties of their said offices respectively.

II. *Style of Commissioners who may sit as a Board to carry this Act into execution, with power to summon and examine witnesses and call for production of papers on Oath, or to substitute a Declaration upon Oath.*

And be it further enacted, That the said commissioners shall be styled "The Commissioners of Patents for Inventions," and the said commissioners, or any *two* of them, may sit from time to time, as they may deem expedient, as a Board of Commissioners for carrying this Act into execution; and the said commissioners acting as such Board, shall be and are hereby empowered, by summons under their hands and seal, to require the attendance of all such persons as they may think fit to call before them upon any question or matter connected with or relating to the administration of the laws relating to Letters Patent for Inventions over which they shall have any jurisdiction or controul by virtue of this Act; and to examine all such persons upon oath, and to require and enforce the production upon oath of all deeds, models, drawings, books, contracts, agreements, accounts and writings, or copies thereof respectively, in anywise relating to any such question or matter; or in lieu of requiring such oath as aforesaid, the said commissioners may, if they think fit, require any such person to make and subscribe a declaration of the truth of the matters respecting which he shall have been or shall be so examined.

III. *To have a common Seal.—Rules sealed to be received as Evidence.*

And be it further enacted, That the said commissioners shall cause to be made a Seal of the said Board, and shall cause to be sealed or stamped therewith all rules, orders and regulations made by them in pursuance of this Act; and all such rules, orders, and regulations, or copies thereof, purporting to be sealed or stamped with the seal of the said Board, shall be received as evidence of the same respectively without any further proof thereof; and no such rule, order or regulation or copy, shall be valid, or have any force or effect, unless the same shall be so sealed or stamped as aforesaid.

IV. *Appointment of one Principal Secretary and Two Registrars of Board.*

And be it enacted, That it shall be lawful for his Majesty, his heirs and successors, under his or their royal Sign Manual, from time to time to appoint a Secretary, and also *two* registrars of the said Board, to attend upon and assist the said commissioners, which officers so to be from time to time appointed, shall hold their respective offices during good behaviour, notwithstanding the demise of his Majesty, or any of his heirs or successors: Provided always, That it shall be lawful for his Majesty, his heirs and successors, to remove any of such officers upon a certificate from the said commissioners of some sufficient reason to be named therein for such removal.

V. *Commissioners to have power to appoint inferior Officers.—Salaries to be regulated by Commissioners of Treasury.*

And be it further enacted, and the said commissioners are hereby authorized and empowered from time to time to appoint such persons as they may think fit, to be an assistant secretary or assistant secretaries, deputy registrar or deputy registrars, and all such clerks, messengers, and other officers as they shall deem necessary, and from time to time to remove the same, or any of them, and to appoint others in their stead: Provided always, That the amount of the salaries of all officers to be from time to time appointed by the said commissioners, shall be regulated by the commissioners of his Majesty's Treasury, or any *three* or more of them.

VI. *Commissioners to take an Oath.*

And be it further enacted, That every commissioner to be appointed by virtue of this Act shall, before he shall be capable of acting in the execution of any of the powers and authorities given by this Act, take an oath in the presence of the Lord Chancellor to the effect following; (that is to say)

> "I, A.B., do swear, that I will faithfully, impartially, and honestly, according to the best of my skill and knowledge, execute the several powers and trusts reposed in me, as one of the Commissioners of Patents for Inventions, and that without favour or affection, prejudice, or malice.
>
> "So help me GOD."

And any commissioner having once taken the said oath, shall not again be required to take the same so long as he shall continue in office.

VII. *Powers of Commissioners to hear and determine all matters relating to Letters Patent for Inventions hitherto heard by Attorney and Solicitor General.—Powers of Commissioners not to interfere with the Jurisdiction of the Judicial Committee of Privy Council or Courts at Westminster.*

And be it further enacted, That the said commissioners, or any *two* of them, shall have superintendence and controul, with power, jurisdiction and authority to hear and determine, order and allow all such matters relating to Letters Patent for Inventions as now usually are or lawfully may be brought by petition or otherwise before his Majesty's Attorney or Solicitor General for England and Ireland, or the Lord Advocate or Solicitor General for Scotland; and also to investigate, examine, hear and determine all such matters and things within the jurisdiction of the said Board of Commissioners as are by this Act assigned and referred thereto: Provided always, That nothing herein contained shall be held or taken to affect the power, jurisdiction, authority and controul in all matters relating to Letters Patent for Inventions now and heretofore held, exercised and enjoyed by the Judicial Committee of his Majesty's most honourable Privy Council, or his

Majesty's Courts of Record at Westminster, or elsewhere, or any of them in any manner whatsoever.

VIII. *Powers of Attorney and Solicitor General to cease, and to be transferred to Commissioners.*

And be it further enacted, That all power, jurisdiction and authority of his Majesty's Attornies and Solicitors General for England and Ireland, and of the Lord Advocate and Solicitor General for Scotland, in all matters and things relating to Letters Patent for Inventions shall cease and determine, and that every such matter and thing shall thereupon be brought under the jurisdiction and controul of the said Commissioners of Patents for Inventions; and all further proceedings therein shall be thenceforth prosecuted and carried on in like manner as if they had been originally commenced before the said commissioners, save as may be otherwise directed by this Act, or the rules and regulations to be established as hereinafter provided.

IX. *Method to be used in obtaining Letters Patent.—Commissioners to publish objects of Petition in London Gazette, and appoint a day for hearing all objections to grant of Letters Patent.—Parties to attend Commissioners by themselves or their Agents to support and oppose grant of Letters Patent.—Commissioners if they shall think the prayer of Petition ought to be granted, to make out a Draft or Bill of Letters Patent, and send same within One calendar Month to Secretary of State for his Majesty's Sign Manual.—Secretary of State to return Draft or Bill, with his Majesty's Sign Manual to Commissioners.—Commissioners to make out Letters Patent, and send same with Draft or Bill to Lord Chancellor.—Authority to Lord Chancellor to affix Great Seal to Letters Patent, and return same to Commissioners.*

And be it enacted, That from henceforth the practice now in use in obtaining Letters Patent for Inventions shall absolutely cease and determine, and that in lieu thereof, every person who shall be hereafter desirous of presenting a petition to his Majesty, his heirs and successors, for the grant of any Letters Patent for the sole making, exercising, vending or using of any Invention, shall leave or cause the same to be left at the office of the registrar of the said commissioners to be appointed under and by virtue of this Act, accompanied by such affidavit in support thereof as hath been heretofore in that behalf accustomed, or as the said commissioners shall by any general order or orders to be at any time issued by them in that behalf direct, and that the said registrar shall thereupon cause such petition and affidavit to be filed and kept as of record for the purposes of this Act; and that it shall be lawful for the said commissioners, and they are hereby authorized and required, as soon as conveniently may be after the filing of the said petition and affidavit, diligently to inquire into and investigate the merits of the said petition, and the truth of the matters therein contained; and for that purpose to cause such publication to be made thereof in the London Gazette, and also in such other manner and under such rules and regulations as the said commissioners, by a general order in that behalf made and issued by them under the provisions of this Act, shall from time to time fix and determine; and shall in every such publication as aforesaid, affix a day or days for the hearing of all objections or opposition which shall or may be made or offered to the granting of the prayer of such petition; and if after hearing the several parties interested in supporting and opposing such petition, either by themselves or their agents, or if no such objection or opposition shall be made, or the parties making the same shall fail to attend to prosecute the same at the time or times to be appointed for that purpose, or if for any other cause it shall appear to the said commissioners that the prayer of such petition is fit and proper to be granted, then and in every such case it shall and may be lawful for the said commissioners, and they are hereby required, within the space of *one* calendar month from the time of the said petition and affidavit being filed by the said registrar as aforesaid, in case no opposition shall have previously been made to the granting of the said prayer, and in case any opposition shall have been made thereto, then within the space of *one* calendar month from the time of such opposition being withdrawn, or the merits thereof being disallowed by the said commissioners, to cause an office copy of the said petition and affidavit respectively, and also a draft or bill of the Letters Patent sought to be obtained thereby, the same to be previously stamped with the seal of the said commissioners, to be left at the office of one of his Majesty's principal Secretaries of State, to be by him laid before his Majesty, his heirs and successors, for the purpose of obtaining his or their Royal Sign Manual to the said draft or bill; and when and as soon as his Majesty, his heirs and successors, shall have been graciously pleased to affix his or their Royal Sign Manual to the said draft or bill, it shall and may be lawful for his Majesty's said principal Secretary of State, and he is hereby directed to cause the same to be returned with all convenient speed to the said commissioners appointed under and by virtue of this Act; and that the said commissioners shall thereupon cause the said draft or bill to which his Majesty's Royal Sign Manual shall have been so obtained as aforesaid to be ingrossed, and the said ingrossment, together with the said draft or bill, to be transmitted to the Lord High Chancellor of Great Britain; and that the said Lord High Chancellor of Great Britain shall thereupon be and is by virtue of this Act, authorized and required to affix the Great Seal of the United Kingdom of Great Britain and Ireland to the said Letters Patent, and to cause the same, together with the said draft or bill, to be forthwith returned to the said commissioners for the purposes of this Act.

X. *Repeal of so much of Act 5 and 6 Will. IV. as relates to entering Disclaimer and Memorandum of Alteration.*

And be it further enacted, That so much of an Act passed in the fifth and sixth years of the reign of his present Majesty, intituled, "An Act to amend the Law touching Letters Patent for Inventions" as relates to the mode in which persons having then obtained, or who might thereafter obtain, Letters Patent for the sole making, exercising, vending or using of any invention, might enter a disclaimer of or memorandum of any alteration in any part of either the title of the Invention, or of the Specification, and the conditions and provisions relating thereto shall be, and the same are hereby repealed.

XI. *Practice in entering Disclaimers.—To apply to Commissioners for leave to enter a Memorandum with Registrar.*

And be it further enacted, That any person who, as grantee, assignee or otherwise, hath obtained, or who shall hereafter obtain, Letters Patent for the sole making, exercising, vending or using of any Invention, shall be desirous of disclaiming, amending or altering any matter or thing in the title of his said invention, or the specification relating thereto, may, if he think fit, make or cause application to be made to the said commissioners, for leave to enter with the registrar of the said commissioners a memorandum of such disclaimer, amendment or alteration, stating the reasons therefore respectively, the same not being such disclaimer, amendment or alteration as shall extend the exclusive right granted by the said Letters Patent.

XII. *Commissioners to publish application for leave to disclaim.—Commissioners to fix a time for hearing parties in support and opposition to such entry.—Memorandum filed with Registrar to be deemed part of Letters Patent or Specification.—Provided in all Suits then pending, original Letters Patent, &c., alone be given in Evidence.*

And be it enacted, That when and as soon as any such application as last aforesaid shall be made to the said commissioners, it shall be lawful for them and they are hereby authorized and required to make or cause to be made such publication thereof in the London Gazette, and also in such other manner and under such rules and regulations as the said commissioners, by a general order or orders in that behalf issued shall from time to time fix and determine; and shall in every such publication as aforesaid, affix a day or days for the hearing of all objections which shall or may be made or offered to the granting of the prayer of such application; and if after hearing the several parties interested in supporting and opposing such application, either by themselves or their agents, and either together or separately, as to the said commissioners shall seem expedient, or if no such objection shall be made, or the parties making the same shall fail to attend to prosecute the same at the time or times appointed by the said commissioners for that purpose, or if for any other cause it shall appear to the said commissioners that the prayer of such application is fit and proper to be granted; then and in every such case it shall and may be lawful for the said commissioners to make such order for the granting of the whole or any part of the said application as shall to them seem fitting and expedient; and such memorandum of disclaimer, amendment or alteration, being filed by the said registrar of the said commissioners, shall be deemed and taken to be part of such Letters Patent, or such Specification, in all courts whatsoever: Provided always, That no such disclaimer, amendment or alteration shall be receivable in evidence in any action or suit (save and excepting in any proceeding by scire facias) pending at the time when such memorandum of disclaimer, amendment or alteration was so filed as aforesaid, but in every such action or suit the original title and specification alone shall be given in evidence, and deemed and taken to be the title and specification of the invention for which the Letters Patent have been or shall have been granted.

XIII. *Stamps on Letters Patent and Specifications reduced to* 10*l.*

And be it further enacted, That there shall be hereafter raised, levied, and paid unto, and for the use of his Majesty, his heirs and successors, in and throughout the whole of Great Britain and Ireland, for and in respect of any Letters Patent to be hereafter granted for the sole making, exercising, using, and vending, of any invention, and in respect of the specification for the same, the sum of *ten* pounds sterling, only *five* pounds thereof to be levied by a stamp to that amount, to be impressed on the first page of every petition to his Majesty, for the grant of his said Letters Patent, and *five* pounds sterling thereof to be in like manner levied, by a stamp to that amount to be impressed upon every specification to be enrolled in pursuance of the proviso in such Letters Patent in that behalf contained; any usage, law, or custom now existing to the contrary notwithstanding.

XIV. *Letters Patent to bear date from filing of Petition; provided that the Specification shall be duly enrolled: and provided that the term of Letters Patent shall bear date from the sealing.*

And be it further enacted, That in all Letters Patent which shall hereafter be obtained for the sole making, exercising, using or vending of any Invention, there shall be inserted a memorandum or indorsement, the same to be verified and attested by the seal of the said commissioners, setting forth the date of the day on which the petition to his Majesty, his heirs and successors, for the grant of the said Letters Patent was filed at the office of the registrar of the said commissioners, and that the said last-mentioned day shall thereupon be held and taken to be the day of the date of the said Letters Patent, in all actions, suits, and other proceedings relating to the said Letters Patent, and to all intents and purposes whatsoever: Provided always, That the specification of the Invention for which the said Letters Patent shall be obtained, shall be enrolled in the manner and within the period in that behalf fixed by the said Letters Patent: And provided also, That the time for which the sole making, exercising, using, and vending of any Invention shall be hereafter secured by any Letters Patent, shall bear date from the day of the sealing of such Letters Patent respectively.

XV. *Letters Patent to extend to Great Britain, Ireland, and the Colonies, except when specially limited.*

And be it further enacted, That all Letters Patent which shall be hereafter granted for the sole making, using, exercising and vending of any Invention shall be held and taken to extend the benefit, advantage, and protection of the said Letters Patent, as well to that part of the United Kingdom called England, as also to those parts of the said United Kingdom called Scotland and Ireland respectively; and also to his Majesty's colonies abroad: Provided always, That it shall and may be lawful for any person who shall be so minded to petition his Majesty for the grant of his Royal Letters Patent for any Invention, the same to extend only to such part of the said United Kingdom as shall be set forth in the prayer of such petition.

XVI. *Property in new design secured to Inventor or Proprietor for Twelve calendar Months.*

And whereas it is expedient, for the greater encouragement of the useful arts and manufactures in these realms, to afford some further protection and assistance to the inventors of new and useful improvements, by vesting the property therein in the inventors or proprietors thereof for a period shorter than that for which Letters Patent for Inventions are usually granted; Be it therefore enacted, That any person who shall hereafter invent, design, or contrive, or shall become the proprietor of any invention, design, or contrivance, whereby in the opinion of such inventor, designer, contriver, or proprietor, some new and beneficial operation or result shall be obtained in any art, science, manufacture, or calling, whatsoever, shall hereafter have the sole right and property in every such new invention, design or contrivance, for and during the term of *twelve* calendar months, from the time of registering the same, in manner and under the regulations herein in that behalf mentioned.

XVII. *Persons availing themselves of this Act, to deposit a Fac-simile, Model or Specimen of their Invention with Commissioners.*

And be it enacted, That every inventor, designer, contriver, or proprietor who shall be desirous of availing himself or themselves of the provisions of this Act, shall deposit or cause to be deposited in the custody of the said commissioners to be appointed under and by virtue of this Act, in the manner and under the regulations hereinafter set forth, or which shall be set forth under and by virtue of the provisions herein contained, a full, true, correct, and perfect fac-simile, model, or specimen of his or their invention, design, or contrivance; with the name and actual place of abode of such inventor, designer, contriver, or proprietor, attached thereto, in such manner as to the said commissioners shall seem expedient, and shall also pay the sum of money in the manner and at the time hereinafter in that behalf respectively mentioned.

XVIII. *Commissioners to find some suitable place for exposing Models, &c. to public inspection.*

And be it enacted, That the said commissioners shall and they are hereby authorised and required to approve of and provide some fit and proper place for the reception of all such fac-similes, models, or specimens, as shall hereafter be deposited in their custody under the provisions of this Act, and shall cause the same to be preserved and exposed to public inspection in as perfect and commodious a manner, and under such rules, regulations, charges, and expenses, as to the said commissioners shall seem fitting and expedient during the space of *twelve* calendar months, from the time of the deposit thereof respectively.

XIX. *Persons depositing Models, &c. to pay the Sums mentioned in Schedule to Act. Entitled to a Certificate sealed by Commissioners.*

And be it enacted, That every person who shall be desirous of availing himself of the provisions of this Act, shall, at the time of depositing such fac-simile, model, or specimen as aforesaid, pay, or cause to be paid to the said commissioners, or on their account, the several sums set forth in the schedule hereto annexed, in respect of the business therein specified, and shall thereupon be entitled to receive from the said commissioners a certificate of license for the same to be sealed with the seal of the said commissioners, certifying the date of such deposit, together with a general outline or description of the fac-simile, model, or specimen, to which the same shall relate.

XX. *Persons imitating subject-matter of License, without consent of Person having license, or mark "Licensed" on same, to be liable to a Penalty of 50l. for every Offence.—Certificate not to exempt Persons from liability for infringement of Patents.—Subject-matter of License not to be afterwards subject of Letters Patent; not to be capable of a second License.*

And be it further enacted, That if any person whatsoever shall at any time during the continuance of the said term of *twelve* calendar months, bearing date from the day of the deposit of such fac-simile, model, or specimen, either directly or indirectly make, vend, or put in practice, or in anywise imitate, counterfeit, or resemble the several inventions, designs, or contrivances, to which the same shall respectively refer; or shall make, or cause to be made any addition thereto, or subtraction from the same, whereby to pretend himself or themselves the inventor or inventors, designer or designers, contriver or contrivers thereof, without the license or consent in writing of the said person or persons, whose name or names shall appear on the said fac-simile, model, or specimen, relating thereto, and deposited as aforesaid, and also in the said certificate of license, or his or their assigns, or if any person shall, upon such thing not having been purchased from the person or persons whose names shall appear on the said model or specimen and certificate of license relating thereto, or his or their assigns, or not having the license or consent in writing of such person or persons, or his or their assigns, write, paint, print, mould, cast, carve, engrave, stamp, or otherwise mark the word "Licensed," or "By the King's License," or any words of the like kind, meaning, or import, or with a view of imitating or counterfeiting the stamp, mark, or other device of the person or persons so having obtained such certificate of license as aforesaid, or shall in any other manner imitate or counterfeit the stamp or mark, or other device of such person or persons, he shall for every such offence be liable to a penalty of *fifty* pounds, to be recovered by action of debt, bill, plaint, process, or information, in any of his Majesty's Courts of Record at Westminster, or in Ireland, or in the Court of Session in Scotland, *one-half* to his Majesty, his heirs and successors, and the other to any person who shall sue for the same: Provided always, That nothing herein contained shall be construed to extend to subject any person to any penalty in respect of stamping or in any way marking the words "Licensed," or "By the King's License," upon any thing made for the sole vending of which a certificate of license before obtained shall have expired: And provided always, That nothing herein contained shall be construed to exempt any person or persons who shall hereafter take advantage of the provisions of this Act to any liability to which he or they may subject himself or themselves in any action, suit, or other proceeding to which they are now or may hereafter become subject by reason of any infringement or alleged infringement of any invention or contrivance for which his Majesty's Royal Letters Patent have been already or may hereafter be obtained: And provided also, That no invention, model, or contrivance, for which a certificate of license shall have been granted under the provisions of this Act, shall be capable of being made the subject of Letters Patent therefore at any time after the date of such certificate, nor shall the same be capable of being made the subject of a second license therefore under the provisions of this Act.

XXI. *Fees respecting Letters Patent to cease.—No Fees payable for any thing to be done under this Act, save as set forth in Schedule or general Order of Commissioners.*

" And be it further enacted, That all fees heretofore payable to any person whatsoever in respect of any Letters Patent for any Invention shall cease and determine; and that no fee whatsoever shall be payable to any person whomsoever holding any office under or by virtue of this Act, except such as are provided by this Act, or in the Schedule hereto annexed, and except all such as the said commissioners, acting by and under the approbation and consent of the Lord Chancellor, shall, by a general order to be issued by them as herein provided, from time to time fix and determine.

XXII. *Secretary of Commissioners to receive Fees in Schedule set forth, and also all other Sums payable under this Act, and to pay same into Bank of England once a Week to credit of Commissioners.—Monies in Bank subject to orders of Commissioners, or as directed by this Act.*

And be it enacted, That it shall be lawful for the secretary of the said commissioners for the time being, and he is hereby authorised and required to receive and take the several fees and sums set forth in the Schedule hereto annexed, in respect of the business therein specified; and the sums to be so received by the said secretary, and all other sums to be received by him under the provisions of this Act, or any general order to be made and issued as herein provided, shall be by him paid once a week, or oftener, as the said commissioners shall think fit to direct, into the Bank of England, to the credit o the said Commissioners of Patents for Inventions, to an account to be opened by them with the Governor and Company of the said Bank, to be intituled, " The Commissioners of Patents for Inventions Account;" and all monies to be paid into the said account shall be subject to such regulations touching the payment in investment, accounting for and payment out of the said monies as herein provided, or as the said commissioners, or any *two* or more of them, by an order to be signed by them, shall for the purposes of this Act direct and appoint.

XXIII. *Salaries of Officers under this Act.*

And be it enacted, That from and after the *commencement of this Act*, there shall be paid and payable out of the monies and securities standing to the said account, to be intituled, " The Commissioners of Patents for Inventions Account," the yearly sums following, as and for salaries to the commissioners and other officers for the time being hereinafter named; videlicet, to the chief commissioner of the said Board the sum of   , to each of the said commissioners of the said Board   , to the secretary to the said commissioners   , to each of the registrars of the said Board   , which said several sums shall be paid from time to time quarterly, free and clear from all taxes and deductions whatsoever, on the *eleventh* day of *April*, the *eleventh* day of *July*, the *eleventh* day of *October*, and the *eleventh* day of *January*, in every year, by equal portions, the first payment thereof respectively to be made on the *eleventh* day of *April* next after the *passing of this Act;* and that if any person for the time being holding either of the said offices shall die, resign, or be removed from the same, the executor or administrator of the person so dying, or the person so resigning or being removed, shall be entitled to receive such proportionable part of his salary as shall have accrued during the time that such person shall have executed his office since the last payment, and that the successor of any such person so dying, resigning, or being removed as aforesaid, shall be entitled so receive such portion of his salary as shall be accruing or shall accrue from the day of such death, resignation, or removal.

XXIV. *Penalty to Officers for taking Fees, or for acting as Patent Agents.*

And be it further enacted, That if any commissioner, secretary, assistant secretary, registrar, deputy registrar, clerk, messenger, or any other officer or person whatsoever, shall, for any thing done or pretended to be done under this Act, or under colour of doing any thing under this Act, fraudulently and wilfully demand, or take, or appoint, or allow any person whatsoever to take for him, or on his account, or for or on account of any person by him named, or in trust for him, or for any other person by him named, any fee, emolument, gratuity, sum of money, or any thing of value whatsoever, other than is allowed by this Act, or any rule, order, or regulation made or to be made in pursuance of the provisions thereof, or shall directly or indirectly be engaged or employed, and either as principal or agent, in the procuring, maintaining, or opposing the grant of any letters patent or license for any invention, or in any matter or thing connected therewith, save in the performance of the duties of his office as such commissioner, secretary, or assistant secretary, registrar, deputy registrar, clerk, messenger, or other officer, such person, when duly convicted thereof, shall forfeit and pay the sum of *five hundred* pounds, and be rendered incapable, and is hereby rendered incapable, of holding any office or place whatsoever under his Majesty, his heirs or successors.

XXV. *Commissioners to form and issue general Orders, and for affixing the Fees not hereby settled.—General Orders not to be valid, except sanctioned by Lord Chancellor.*

And be it further enacted, That the said commissioners shall, and they are hereby required forthwith and from time to time, as it shall appear to them expedient, to make and issue such general orders as they shall think fit for carrying the provisions of this Act into execution, and also for regulating and affixing the fees to be hereafter paid and payable at the offices of the Lord High Chancellor and of his Majesty's principal Secretary of State respectively, as well as the other fees to be paid and payable at the office of the said commissioners appointed under and by virtue of this Act, and which are not set forth in the Schedule hereto annexed, in respect of the several matters and things to be performed at the said offices respectively, and shall also from time to time make and establish such other rules and regulations, not being inconsistent with the enactments and provisions of this Act, or of any general order to be made and issued as aforesaid, as they shall in their discretion think fit and proper for simplifying, establishing, and settling the practice to be henceforth in use relating to letters patent and licenses for inventions, and from time to time to alter and rescind the same, or any of them: Provided always, That no general order of the said commissioners shall operate or take effect until the same shall have received the sanction and assent of the Lord High Chancellor.

XXVI. *Compensation to be awarded to Persons injured by the operation of this Act. Commissioners of Treasury to take into account whether any Office under this Act is held by person claiming Compensation.—Commissioners of Treasury to award Compensation.—Commissioners of Treasury to signify amount of Compensations to Commissioners of Patents, who shall thereupon order same to be paid out of Monies standing to account of said Commissioners.—Rates of Compensation to be laid before Parliament.*

And whereas the duties of his Majesty's Attornies and Solicitors General for England and Ireland, and also of the Lord Advocate and Solicitor General for Scotland, and of divers other public officers and persons in respect of Letters Patent for Inventions, and the fees and emoluments which they have been accustomed to receive in respect of such duties, will be abolished by this Act, and it may be just and necessary that in all or some of such cases compensation should be made in respect of such fees; Be it therefore enacted, That it shall be lawful for the commissioners of his Majesty's Treasury for the time being, or any *three* or more of them, and they are hereby authorised and re-

SCIENTIFIC ADJUDICATIONS.

IN THE COURT OF COMMON PLEAS.—JAN. 30.

IN BANCO.

resent he Lord Chief Justice, Mr. Justice Park, Mr. Justice Gaselee, and Mr. Justice Vaughan.

CORNISH v. KEENE.

The subject of the action to which the following judgment refers, was given in the 8th vol. of our present Conjoined Series, page 59.

JUDGMENT.

The Lord Chief Justice—This arises on a motion to the Court to set aside a verdict obtained by the plaintiff, the assignee of the original patentee in an action for the infringement of the patent, and to grant a new trial upon three grounds—First, that in point of law, the invention for which the patent was taken out, was not the subject matter of a patent; secondly, that the verdict was against the evidence given at the trial; and, thirdly, upon the facts disclosed in an affidavit.

The patent in question, which bears date the 17th of January, 1833, was for an improvement or improvements in the making or manufacturing of elastic goods or fabrics applicable to various useful purposes; and the Patentee, in his specification which was inrolled in July, 1833, described his invention in general terms, to be designed for the production of an elastic web, cloth, or other manufactured fabric for bandages, and for such articles of dress as the same might be applicable to. It then describes more particularly the three distinct objects which the Patentee proposed. At the trial of the cause it was admitted on the part of the defendants, that the principal ground on which the patent was sought to be impeached, was with reference to the third object described in the specification; and the whole of the evidence at the trial produced by the defendants, and the main part of the argument before us, applies itself to that object alone. The third object proposed by the Patentee, was " to produce cloth from cotton, flax, or other suitable material not capable of felting, in which should be interwoven elastic cords or strands of India rubber, coated or wound round with filamentous material." The Patentee afterwards describes the mode of effecting the third object to be "by introducing into the fabric threads or strands of India rubber, which have been previously covered by winding filaments tightly round them, through the agency of an ordinary covering machine, or otherwise these strands of India rubber being applied as warp or weft, or as both, according to the direction of the elasticity required. By thus combining the strands of India rubber with yarns of cotton, flax, or other non-elastic material, the Patentees are enabled to produce a cloth which shall afford any required degree of elastic pressure according to the proportions of the elastic and non-elastic material." The Patentee added, "that the strands of India rubber are in the first instance stretched to their utmost tension, and rendered non-elastic, as described in a former specification to another Patent, and being in that state introduced in the fabric, they acquire their elasticity by the application of heat after the fabric is made."

Now the first objection made to the patent so described is, that the invention is not the subject matter of a patent; that it is neither a new manufacture, nor an improvement of any old manufacture; that it is merely the application of a known material in a known manner to a purpose known before. The question then as to this point is, does it come under the description of any manner of new manufacture in the terms employed in the statute of James? That it is a manufacture can admit of no doubt; it is a vendible article produced by the art and hand of man; and of all the instances which would occur to the mind where inquiring into the meaning of the terms employed in the statute, perhaps the very readiest would be that of some fabric or texture of cloth of a nature similar to the present; whether it is, or not, or whether it is an improvement of an old manufacture, was one of the questions upon the evidence for the jury, which will form the subject of the next inquiry; but that it comes within the description of a manufacture, and so far as an invention, which may be protected by a patent, we feel no doubt whatever. The materials indeed are old, and used before, but both the combination is alleged to be, and is new, if the jury are right in their finding, and the result or combination is equally so. The use of elastic threads or strands of India rubber, previously covered with filaments wound round them, was known before. The use of yarns of cotton, or other non-elastic material, was also known before; but the placing them laterally together for the warp, and combining them by means of the weft, when their extreme tension had deprived them of elasticity, appears to be new, and the result, namely, that the non-elastic threads form a limit not to which the elastic threads may be stretched, but beyond which they cannot be broken, appears to be a result altogether new. It is a manufacture at once ingenious and simple; it is a web combining the two qualities of great elasticity, and a limit thereto.

The second objection to the verdict is, that it is against the evidence. The only issue to which this objection has applied itself in the course of the argument, is the issue whether the invention was new as to the public use thereof in England. Now the evidence at the trial, which applied itself to this question, consisted of two perfectly distinct heads or classes, the documentary evidence of former patents and specifications, and the parole testimony of the witnesses. It was argued that the present invention was, on the whole, or a material part of it, already known to the public by the specification to the patent obtained by Hancock, which was enrolled in August, 1820, and the specification of a former patent enrolled by Sievier in June, 1832. As to Hancock's patent, it is manifest that if it applied at all to the invention for which the patent, now under discussion, was taken out, it applied only to the first object stated in the specification, all contention as to which object was given up at the trial; but the description in Hancock's patent shows a material between his discovery and that of Sievier. Hancock's patent was taken out for a discovery of the application of a certain material to certain articles of dress, by means of which the same may be rendered more elastic; and the mode by which this was effected is described in the specification to be that of applying slips of India rubber to cases or pipes formed in the article after it was complete. The first object of Sievier's patent is, that of introducing the cords or strands of India rubber between the loops or stitches of the fabric itself, so as to form a constituent part of the fabric itself; and as to the first patent of Sievier. it was a patent taken out for the making of cables, ropes, whale-fishing and other lines, lathe and rigger bands, bags and purses of filaments, or threads of India rubber covered with cotton or other materials. The bands and bags were to be knitted, not woven; and there was no attempt to mix with them any non-elastic materials to strengthen them, or form a limit to their elasticity, or for any other purpose. These patents therefore do not by any means, as it appears to us, affect the novelty of the present invention.

As to the evidence of the witnesses brought forward on each side of the trial, it must be admitted that there was evidence on both sides. The question raised was this, whether the various instances brought forward by the defendants amounted to proof that before, or at the time of taking out the patent, the manufacture was in public use in England? or whether it fell short of that point, and proved only that experiments had been made in various quarters, and had been afterwards abandoned?

This question is, from its nature, one of considerable delicacy and difficulty. A slight alteration in the effect of the evidence will establish the one or the other side of the proposition. The only proper mode of ascertaining such a fact is by a trial before a jury. They heard the evidence patiently, and appeared to apply to it intelligence, and we see no reason to be dissatisfied with the conclusion at which they arrived.

With respect to the third ground on which the rule to show cause was obtained in this case, namely, that since the trial the defendants had discovered a patent taken out by one Des Grand, the patent being sealed in November, 1832. Without entering into the question whether the invention for which the Patent in dispute was taken out was, or was not, described in the specification of Des Grand, we think it sufficient to observe, that his specification was not inrolled till May, 1833, whereas the article made under the plaintiff's patent was publicly sold in the London market to a very large extent in March and April of the same year; and though the specification of Sievier's patent was not inrolled till July, 1833, we think the mere fact of Des Grand's specification being inrolled after the plaintiff's patent was sealed, and his discovery made known in the market, does not of itself alone afford any proof whatever of the want of novelty in the manufacture made under the plaintiff's patent.

We therefore think there is no ground for disturbing the verdict, and the rule for a new trial must be discharged.

KAY v. MARSHALL.

This was a cause which came before Sir James Parke and a Special Jury at York, in July, 1836, arising out of a reference from the Court of Chancery.

Mr. Watson opened the pleadings, by stating that Mr. James Kay, of Pendleton, near Manchester, the plaintiff, is the Patentee of "an improved machinery for preparing and spinning flax, hemp, and other fibrous substances by power," granted 26th July, 1825. (See "London Journal," First Series, vol. xiv. p. 82.) The improvement consisted in a mode of spinning rovings of flax or hemp by feeding the rovings into the spinning machine after they had been macerated in cams, having bottoms like colanders, immersed in warm water; the essential feature of novelty in the improved machinery being, the placing of drawing rollers nearer together, that is, having a shorter ratch than had ever been done before for drawing and spinning flax or hemp. The adhesion of the fibres, caused by the warm maceration, allowing the flax, when broken into short staples, to be drawn at a short ratch, and spun into fine yarn. The defendants, Messrs. Marshalls, of Leeds, had, it was alleged, infringed the Patentee's machinery. A bill of complaint had been filed by the plaintiff to restrain the defendants from using the said invention, whereupon a question arose as to whether the plaintiff had before, and at the time of the making the Letters Patent in the said bill of complaint mentioned, found out, and invented *any new and improved machinery,* as in the said Letters Patent and bill of complaint and specification, is alleged; and also whether the alleged invention was of *much or any public benefit or utility.*

Sir Frederick Pollock argued the case for the plaintiff, and pointed out the great advantages which had arisen from the introduction of the improvement. The counsel stated, that cotton, in its raw state, is worth about 10d. per pound, and when spun, 1s. 6d.; but flax in its raw state, worth only 6d., will, when spun, fetch 4s.: hence, the improved value after spinning, by the new process, is 800 per cent. The fibres of flax are non-elastic, and individually of fifteen or twenty inches long when in a dry state; therefore, to draw or make the fibres slip from one another in order to produce fine yarns, the drawing rollers must be placed at that, or a greater distance apart, called the ratch. But the Patentee found that by macerating his flax in warm water, the fibres would slip at very short distances; and, therefore, he claimed as his improvement, placing his drawing rollers and retaining rollers "nearer to each other than they had ever before been placed, say within two and a half inches of each other, for the purpose aforesaid;" by means of which, he had been enabled to produce finer yarns of flax than had been produced before by machinery.

A very long discussion took place, and many witnesses on the part of the plaintiff were called, from one of whom (Mr. Joshua Wordsworth, of Leeds,) it was elicited that flax had formerly, been spun by machinery at a ratch varying from fourteen to twenty-four inches: that in a machine for spinning flax, invented by Horace Hall, in 1814, the fibres had been drawn in a wet state, at a ratch varying from four to seven inches; and tow, in a dry state, from four inches and a half to nine inches. The length or staple of worsted varies much, it is drawn for spinning at a ratch of from two inches and a half to twelve inches; and cotton, the fibres of which are short, is drawn at a ratch from seven-eighths of an inch to one inch and a quarter; but it was not known that flax could be drawn at such a short ratch, until the plaintiff discovered it. A specification, however, was produced, of a machine for drawing flax, in which the drawing rollers were capable of being shifted and adjusted to any required length of ratch.

Mr. Creswell, for the defendant, contended that from the plaintiff's witnesses, it was clear there was nothing new in the invention, and that the question referred by the Court of Chancery was, "whether there was any such novelty in this invention as would sustain a patent."

Mr. Baron Parke considered that was not the issue directed to be tried. He should go to the jury to find whether spinning macerated flax at short distances is new, and endorse upon the record as the case stands; that parties have been in the habit of using machinery with ratches of various lengths, but that it was not before known that flax could be dealt with as having a short fibre; and so leave the Lord Chancellor to deal with it as he may think proper. Is not this principle of macerating new?

Mr. Creswell—As applied to flax I admit that it is, but not so the spinning at a short ratch, for it was shortened before.

Mr. Baron Parke—To any thing like two inches?

Mr. Creswell—Horace Hall's ratch was four inches.

Mr. Baron Parke—The application of macerated flax to machines of short distances there is no doubt is new, and according to the evidence each part is new.

Mr. Creswell—The principle of reducing long flax to short flax no man dreamt of denying.

Mr. Baron Parke—Whether he could have a patent for that because he used the sliding ratch which was in use before, is not the question for the jury, but a question of law; the other is not a question of law, but of fact. We had better take a verdict at once for the plaintiff, and endorse the special matters on the posta.

Mr. Creswell—Will your lordship state what you will endorse, that I may know what course to take?

Mr. Baron Parke—I should endorse that they have been in the habit of using the machines so as to adapt the ratch to the staple of the commodity to be spun, whatever it was, but that it had never been known before the plaintiff's patent that flax would spin with so short a ratch.

Mr. Creswell—But this fact must be taken, that Hall reduced the ratch to four inches.

Mr. Baron Parke—I should say that Hall reduced the ratch to four inches, but that his machine did not answer.

Mr. Creswell—I shall give some evidence upon that.

Mr. Baron Parke—But for the saving of time you might take it that the plaintiff first spun at two inches and a half.

Mr. Creswell—I believe there is no question that till this patent came out flax was not spun at two inches and a half.

Sir F. Pollock—I believe that till this patent came out flax had not been so macerated as the plaintiff directed.

Mr. Creswell—And I believe it may be taken upon Mr. Wordsworth's showing, that the very high numbers are now spun at a ratch of an inch and a half.

After some further conversation between counsel, it was agreed to take a verdict for the plaintiff on both issues, subject to the special indorsement on the postea; but before the terms of that indorsement were finally settled, some further questions were put to Mr. Wordsworth, and *Mr. Thomas Birley*, of the firm of Birley and Co., of Kirkham, in Lancashire, was also examined. Mr. Creswell also read two passages from Horace Hall's specification; in one of which, Mr. Hall said—"And I do pass my hemp, flax, or substance containing fibre, from the bobbin A upon the comb C C, and between the rollers D and E, by which action the same becomes combed and drawn out, and becomes damped by reason of the roller D revolving with its lower surface in water;" and the other passage stated—"Figure 6 is a side view similar to figure 3, but showing R R R R, a trough holding a solution of soap or other well-known solutions fit for the purpose, in which the lower surfaces of the rollers A, B, and D, are plunged, and the said hemp, or flax, or substance containing fibre, become wetted therewith, is made more lax, and the fibres thereof slip past each other with greater ease."

A verdict was accordingly entered for the plaintiff on both issues, the following special matter to be endorsed. "That before the granting of the patent, hemp, flax, and other fibrous substances were spun by machines with slides by which the reach was varied according to the length of the staple or fibre of the article to be spun; and that has been the fundamental principle of dry spinning known and used before the granting of the patent; the reach having varied—in cotton spinning between seven-eighths of an inch to an inch and a quarter; in flax or line spinning, from fourteen to thirty-six inches; in tow spinning, from four to nine inches; in worsted spinning, from five to fourteen inches—but before the granting of the patent, it was not known that flax could be spun by means of maceration, as having a short fibre, at a reach of two and a half inches, or about those limits; but before that time, Horace Hall had taken out a patent for 'an improved method of preparing and spinning hemp, flax, and other substances containing fibre,' with a specification (containing amongst other things the two passages last before quoted), &c.; and the machines manufactured according to that patent, were constructed with a reach of four inches and three-quarters."

A great number of witnesses were in attendance on the part of both plaintiff and defendants, but the Judge thought it unnecessary to proceed further with the case, having obtained the main facts on which the future decision as to the validity of the plaintiff's patent, in the Court of Chancery, will depend.

The minutes of the above trial came before the Master of the Rolls, at Westminster, 28th and 31st January, when a motion was made on the part of the defendant, Moses Marshall, for a new trial. A very long discussion took place, on points of law and practice of the courts, which would be totally uninteresting to our readers.

As to the matter of the patent, the Master of the Rolls said, it is evident from the note of his lordship, that the verdict has not determined the validity of the patent. He says—upon this evidence I thought there was no difficulty in either of the questions of fact to be tried, and I gave no opinion upon the question of law. There as a legal question independently of these matters to be ried. It was the opinion of the judge that there was a question of law not determined at the trial of that issue.

Mr. Pemberton—My lord, the judge's finding is this, that the only thing which distinguishes Mr. Kay's invention is, that what people had spun before at four inches and three quarters, they can now spin at two inches and a half; but if this be the distinguishing feature of Mr. Kay's invention, and it is to rest upon this—the precise distance of this two inches and a half, I ask, how is it possible to maintain this patent.

Sir Frederick Pollock—It is impossible to resist the remarks that have been made, and I never contemplated escaping the inquiry whether the patent was valid, or whether the patent was not valid; that question is fairly raised by the pleadings in equity, but at present all that I shall address myself to is this—that upon this motion nothing can be done by your lordship now here to-day, but to grant or refuse a new trial: the rest is entirely matter for another occasion, when the cause comes on for further directions; and if my learned friends make this application merely because they may not be told by and bye when the cause does come on for further directions, that they ought to have applied for a new trial, and that they are in a worse condition because they did not apply, they have escaped that imputation; they have made the application, and I shall now present to your lordship the views of the argument which occur to me, to show that the application for a new trial ought not to be granted.

After Sir F. Pollock had argued the case at considerable length, the Master of the Rolls observed with regard to the trial at York, the result is, that the legal question which arises upon this is left unconsidered at present.

Sir F. Pollock—O yes, my Lord! I admit that.

The Master of the Rolls—Then, if that must be tried some time or other, the question is, as to the mode of trial. Am I to dispose of it upon the facts as collected in the course of these proceedings? or, if I am not, is it not the proper course to have it decided by a case which embodies those facts? One of these two things must be done when the cause comes on for further directions, which may not be for a twelvemonth. Now, if it should turn out that there ought to be a case, it is greatly to the advantage of your client to have it tried previously, as you might lose a great deal of time in having the fruits of your patent, if it turns out to be valid. I cannot certainly decide it without hearing the cause on further directions; but if it is to be decided upon a case, you may have a decision upon that case long before you may have it determined by me upon further directions.

It was then determined that a conference between Counsel had better be taken to consider whether the points raised as objections should be sent for trial before a jury, or referred to a Master in Chancery.

On the second day of hearing, the Master of the Rolls, addressing Sir F. Pollock, said, you are willing then that a case should be made for the opinion of a Court of Common Law.

Sir F. Pollock.—That I understand to be the suggestion of your Lordship.

The Master of the Rolls.—What does Mr. Pemberton say to that?

Mr. Pemberton.—We are quite ready, my Lord; the case to be settled by the Master, and if it shall be found necessary, an application is to be made to your Lordship. The question will be, "whether the patent is valid in point of law?"

The Master of the Rolls.—The consideration of the question should be had now. You propose that the question should be, "whether the patent was valid in law?"

Mr. Pemberton.—Yes, my Lord, and the Court direct the question.

The Master of the Rolls.—I mean the form of the question must be settled now; what do you say to that, Sir Frederick Pollock?

Mr. Barber.—Your Lordship thinks a case under the circumstances.

The Master of the Rolls.—The case will state all the facts, the case will be what is now determined upon. Mr. Pemberton proposes that the question should be, "whether the patent is valid in law?"

Sir F. Pollock.—My Learned Friend says, the case to be settled by the Master: I stated before, and I beg leave to state now, (as far as I can form any judgment,) that will probably lead to a great expense and great delay, and as I thought it was conceded the other day that in the event of any dispute as to the facts, the Learned Judge who tried the cause should settle the facts, I apprehend that would be much the more convenient way of proceeding on the present occasion. I will state why: I apprehend the only facts that can be stated to the Court at law are those facts which have been found upon the trial of the issue, or those facts which must be considered as immediately and necessarily arising out of them, so as to give the Court information to decide the point at law. Now, my Lord, we are accustomed to settle a case upon the notes of a Learned Judge continually in this manner: the two juniors, with their instructions, which in that case would be nothing more than the note, not, I mean of all that passed on the trial, but the finding of the jury and the indorsement on the postea of the facts found by the arrangement of the parties afterwards, that would be the way as to a case. If the gentlemen differ, the proper tribunal—the ordinary tribunal—is the Judge who tried the cause, who would, state what he meant by the indorsement which he took down with his own hand-writing, listening first on one side, and then on the other,—that Judge would be undoubtedly the last resort.

The Master of the Rolls.—I stated before, and I state now, that if the parties differ, and they cannot settle it before the Master, I am very willing that they should apply to me, and if the application is made to me, then I shall be willing to communicate with the Learned Judge.

Sir F. Pollock.—Then your Lordship sees we first get before the Master.

The Master of the Rolls.—I don't know that I ought to anticipate any difference between you.

Mr. Pemberton.—It is the common practice of the Court; the Court has no power to order any other course.

Sir F. Pollock.—I don't understand what my friend means by saying that the Court has no power, when we are provoking a discussion, in what manner something shall be done entirely by consent, if my Learned Friend means to say he will not consent, that is another matter. No doubt this may be as Dawes and Ben was (that was the case cited by my friend the other day), it was an issue tried, the jury found certain facts, and a case was stated for the opinion of the Court, out of which the record came, and that case was argued, and it was referred to the Master.

The Master of the Rolls.—It never came here at all—that was the case when the Learned Judge himself thought fit to reserve the case.

Sir F. Pollock.—I am only saying, in point of form, there can be no difficulty whatever for the slightest intimation from your Lordship to the parties here, that a case should be argued, and the least intimation to the Learned Judge who tried the cause, would make him instantly adopt it; it would not be before the Court in which he sits as Judge; the least intimation whether in his Court or not, would induce him to say I will take that course.

The Master of the Rolls.—If the two juniors can agree upon a case, very well; if they cannot, let it be mentioned to me.

Mr. Pemberton.—We cannot refer it to the Judge, for what court is to decide it?

The Master of the Rolls.—All I can do is to communicate with him, and to obtain his assistance, if required.

Sir F. Pollock.—My only anxiety is this, that we may have the matter brought before your Lordship as early as possible, otherwise we shall gain nothing.

The Master of the Rolls.—I dare say the two Counsel can meet to-day. I hope you will agree, Mr. Booth, and take care to have the case fairly and accurately stated.

Mr. Booth.—Yes, my Lord.

Sir F. Pollock.—I presume the Court of Common Pleas will be the Court, that is the Court in which the record is.

The Master of the Rolls.—I have no objection. I believe it is the Court most at leisure.

Sir F. Pollock.—It is so, my Lord.

The Master of the Rolls.—I have no objection to the Court of Common Pleas.

Sir F. Pollock.—It is the very Court in which the record is, my Lord.

The Master of the Rolls.—Be it so, Sir Frederick.

New Patents
SEALED IN ENGLAND,
February, 1837.

To John Springall, of Oulton, in the county of Suffolk, iron-founder, for his invention of improved shoes for horses and other animals.—Sealed 31st January—6 months for inrolment.

To James Cook, of Birmingham, in the county of Warwick, gun-maker, for his invention of improvements in gas-burners.—Sealed 2nd February—6 months for inrolment.

To William Geeves, of Old Cavendish-street, in the county of Middlesex, gentleman, for his invention of certain improvements on steam-engines. Sealed 2nd February—6 months for inrolment.

To Michael Linning, of Hill-street, Edinburgh, one of the Clerks to the Signet in Scotland, for his invention of a certain improved method of operating for the purpose of converting peat moss and peat turf or bog into fuel, and obtaining from it tar, gas, and other certain substances or matters.—Sealed 6th February—6 months for inrolment.

To John Gemmell, of Stockwell-street, in the city of Glasgow, in the county of Lanark, merchant, for his invention of certain improvements in steam-boats, ships, and other vessels, which are partly applicable to other purposes.—Sealed 6th February—6 months for inrolment.

To William Boarder, of Bradford, in the county of York, millwright, for his invention of certain improvements in steam-engines.—Sealed 16th February—6 months for inrolment.

To John Walker, of Allen-street, in the parish of Lambeth, in the county of Surrey, oven-builder, for his invention of an improved method of heating coppers, stills, and boilers.—Sealed 16th February—2 months for inrolment.

To William Stedman Gillet, of Guildford-street, in the county of Middlesex, gentleman, for his invention of improvements in harness for draft and saddle horses. —Sealed 16th February—6 months for inrolment.

To Richard Burch, of Heywood, in the county of Lancaster, mechanist, for his invention of certain improvements in locomotive steam-engines, to be used either upon rail or other roads; which improvements are also applicable to marine and stationary steam-engines.—Sealed 16th February—6 months for inrolment.

To Robert Smith, of Manchester, in the county of Lancaster, engineer, for his invention of certain improvements in the means of connecting metallic plates for the construction of boilers and other purposes.—Sealed 16th February—6 months for inrolment.

To John Isaac Hawkins, of Chase Cottage, Hampstead-road, in the county of Middlesex, civil engineer, for certain improvements in the application of the products of combustion in generating and in aiding of steam for giving motion to steam-engines; being a communication from a foreigner residing abroad.—Sealed 16th February—6 months for inrolment.

To Henry Elkington, of Birmingham, in the county of Warwick, gentleman, for his invention of improvements in covering or coating of certain metals with platina, and also improvements in gilding certain metals, and in apparatus used in such processes.—Sealed 17th February—6 months for inrolment.

To Henry Elkington, of Birmingham, in the county

METEOROLOGICAL JOURNAL,

FOR JANUARY AND FEBRUARY, 1837.

	Thermo.		Barometer.		Rain in inches.		Thermo.		Barometer.		Rain in inches.
1836.	Hig.	Low.	High.	Low.		1837.	Hig.	Low.	High.	Low.	
Jan.						Feb.					
26	44	39	29,60	29,54	,35	10	51	41	29,91	29,67	,025
27	39	34	29,75	29,67	,375	11	49	46	29,48	29,08	,325
28	37	31	29,81	29,79		12	45	31	29,46	29,35	,325
29	35	28	29,71	29,69		13	51	34	29,23	29,18	,2
30	42	25	29,72	29,69	,1	14	47	29	29,64	29,25	,125
31	48	33	29,89	29,82	,025	15	46	23	30,00	29,88	
Feb.						16	55	41	30,05	30,01	
1	44	33	30,06	29,89	,0125	17	50	36	30,21	30,13	
2	46	36	30,22	30,15		18	49	27	29,98	29,57	,025
3	45	34	30,28	30,22	,025	19	51	28	29,68	29,19	
4	39	25	30,28	30,25		20	45	34	29,68	29,38	,875
5	38	29	30,25	30,23		21	50	39	29,62	29,47	,15
6	34	21	30,25	30,24		22	45	32	29,90	29,75	,05
7	34	22	30,20	30,16		23	49	34	29,62	29,21	,15
8	45	24	30,09	Stat.		24	45	29	29,90	29,60	,1
9	49	36	30,17	30,00	,0	25	42	27	30,10	29,98	

Aurora Borealis.—On the night of the 18th, from eleven till nearly an hour after midnight, we had the most splendid Aurora perhaps ever witnessed in this latitude; the coruscations were intensely red, and extended, at times, to within a few degrees of the moon, which was not many hours from the opposition.

Edmonton. CHARLES HENRY ADAMS.

Latitude 51° 37 32 N.
Longitude 3 51 West of Greenwich.

Smith's Steam Engine

Fig. 1

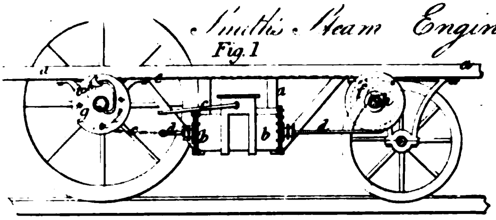


Fig. 2

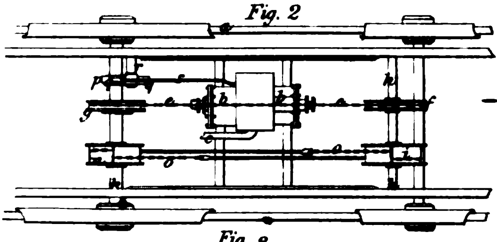


Fig. 3

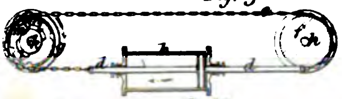


Fig. 7

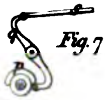


Fig. 4

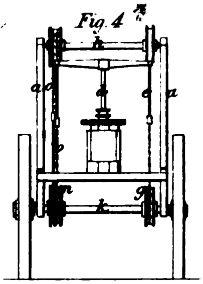


Fig. 5

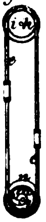
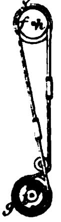


Fig. 6



Peyre's Impd. Ship's Hearth

Fig. 11

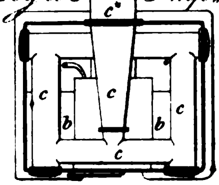


Fig. 12

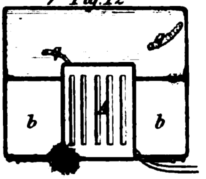


Fig. 10

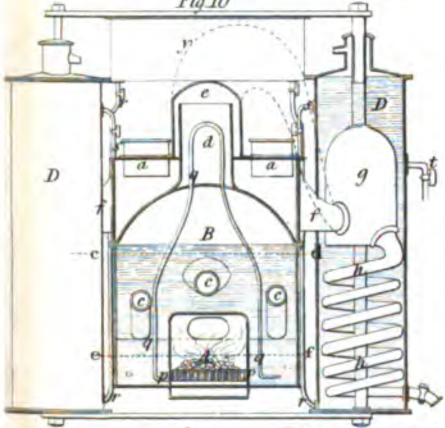
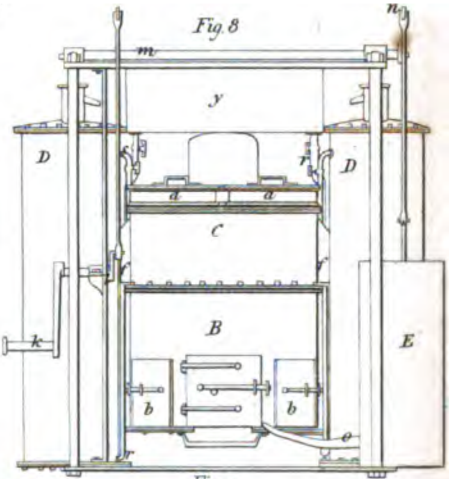
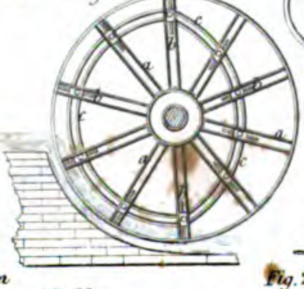


Fig. 8



Leeming's Water Wheel

Fig. 14



Radley's Gauge

Fig. 13

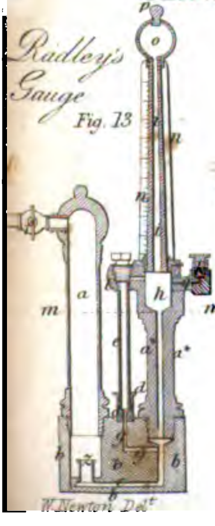
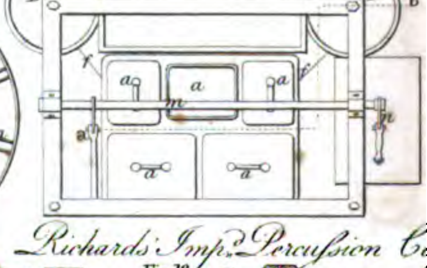


Fig. 9



Richards' Impd. Percussion Cap

Fig. 15

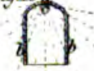


Fig. 16

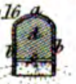


Fig. 22

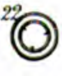


Fig. 23

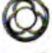


Fig. 24

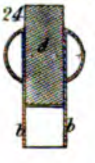


Fig. 18

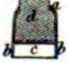


Fig. 19

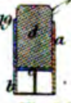


Fig. 17

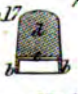


Fig. 21

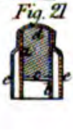


Fig. 20

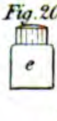
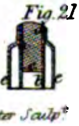


Fig. 21



W. Newton Delt.   1. Oct. 1836   G. Winter Sculpt.

Berry's Bolt & Rivet Mach.ʸ

Fig. 1

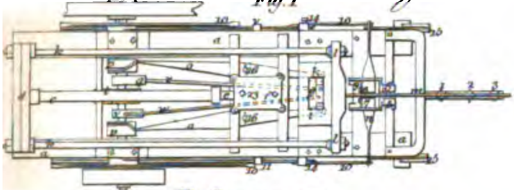


Fig. 5

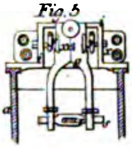


Fig. 4

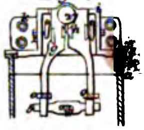


Fig. 2

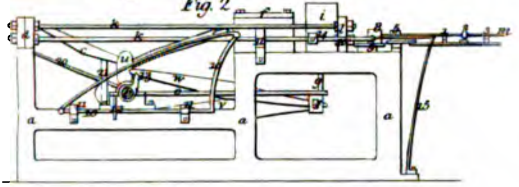


Fig. 8

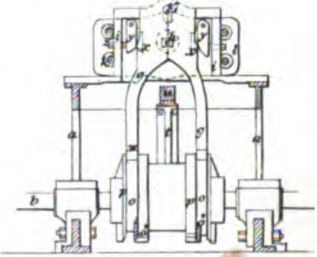
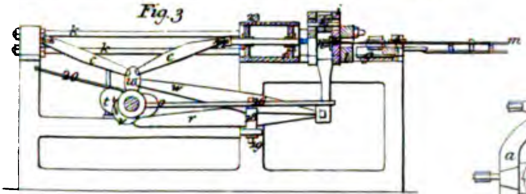


Fig. 3



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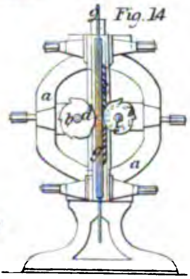


Fig. 10

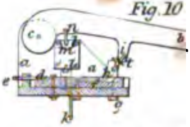


Fig. 11

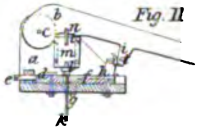


Fig. 6

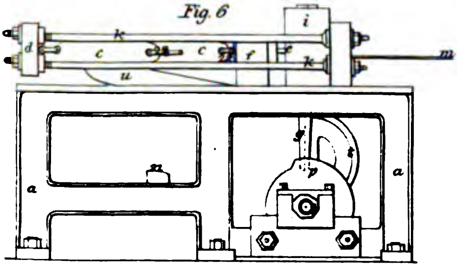


Fig. 12

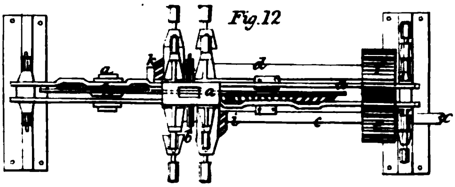


Fig. 7

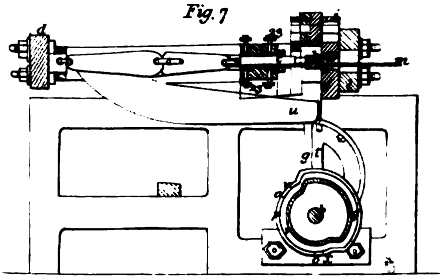


Fig. 13

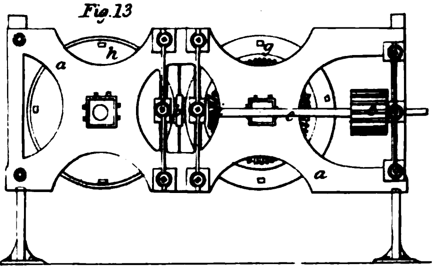
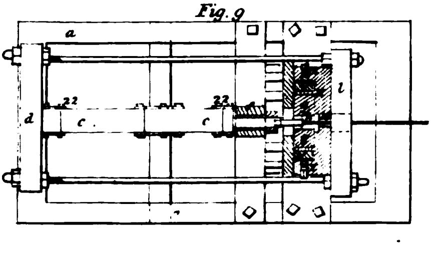


Fig. 9



Sylvester's Impt. in Conveying Heat

Fig. 19

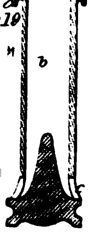


Fig. 18

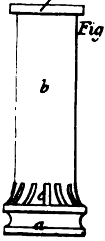


Fig. 15

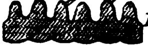


Fig. 16

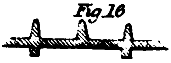
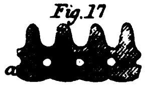


Fig. 17



W. Newton Del.ᵗ
1. Octʳ 1836
G. Winter Sc.

VOL. IX   s Power Loom   PLATE IV.

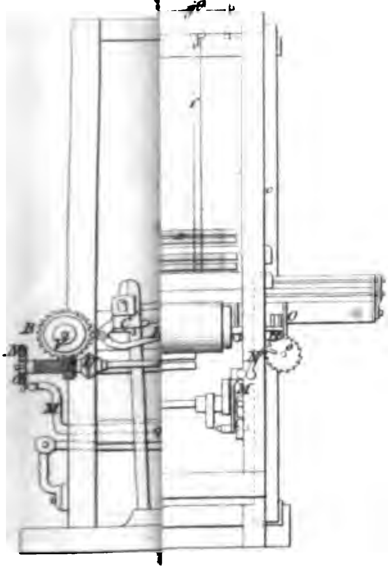
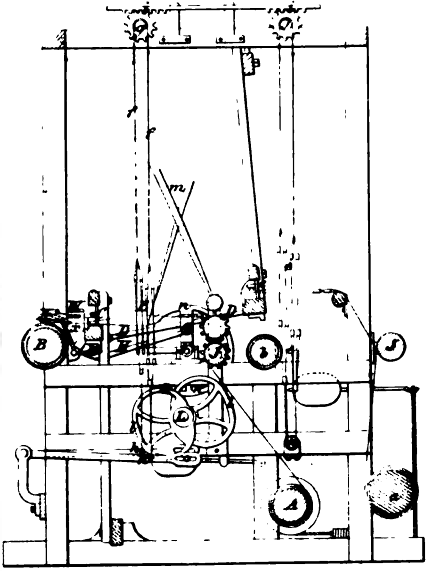


Fig. 3



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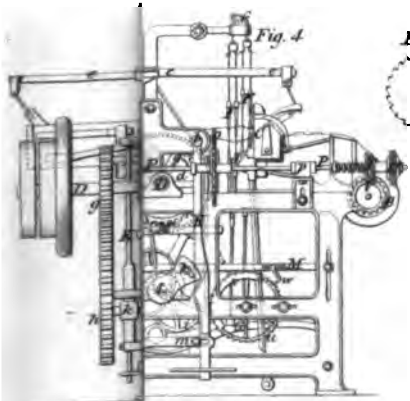

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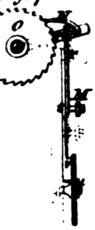

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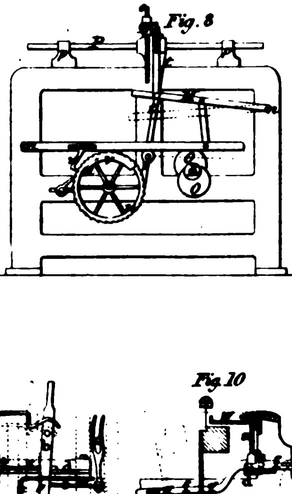

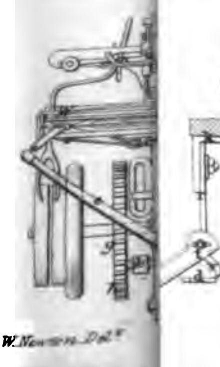

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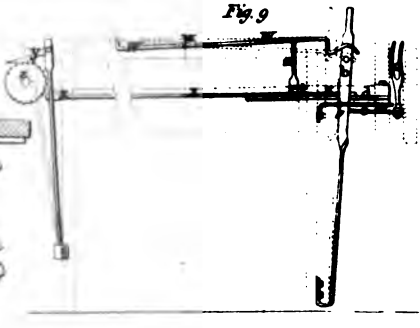

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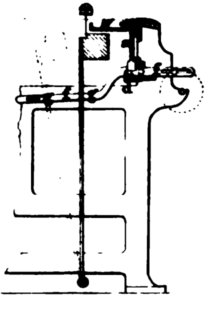
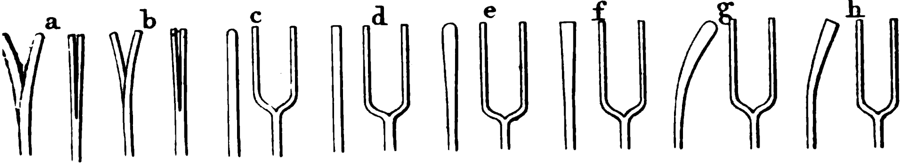


W. Newton Del.^t   S. Bellin Sculp.^t



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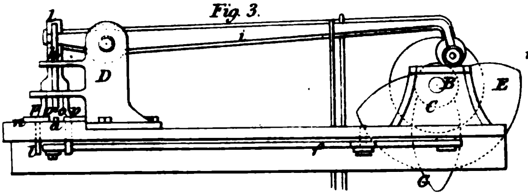

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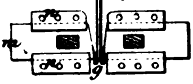

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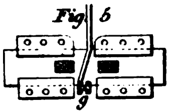

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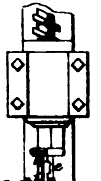
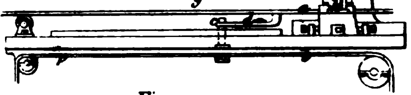
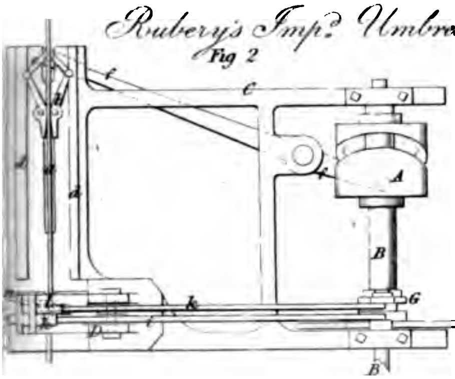




Rubery's Imp. Umbrellas

Fig 2



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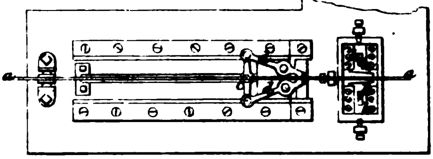

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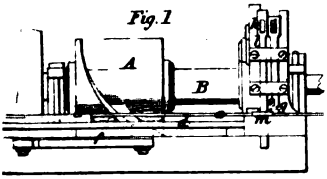

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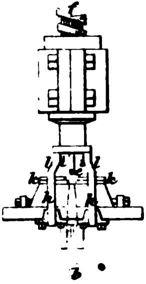
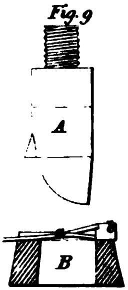


Fig. 9



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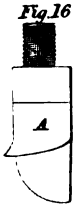

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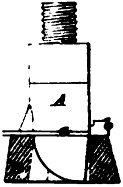

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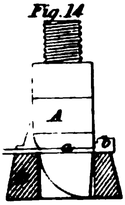
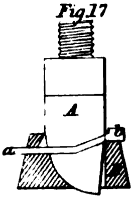
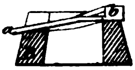


Fig. 17





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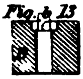

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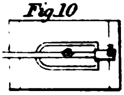

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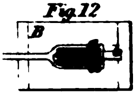

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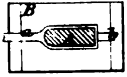

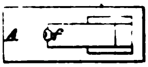

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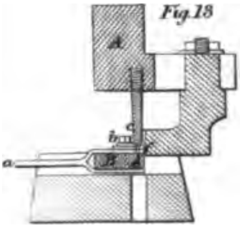
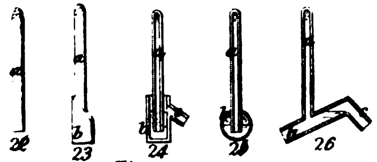
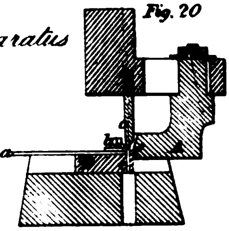


Blurton's Milking Apparatus



Figures

Fig. 20



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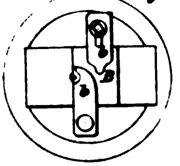
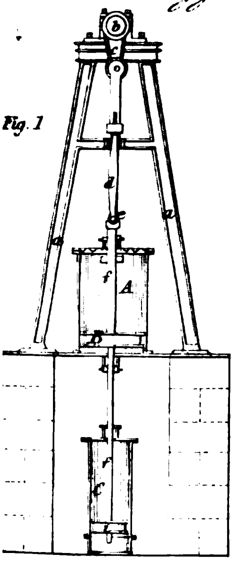


Diggle's Impd. Steam Engine

Fig. 1



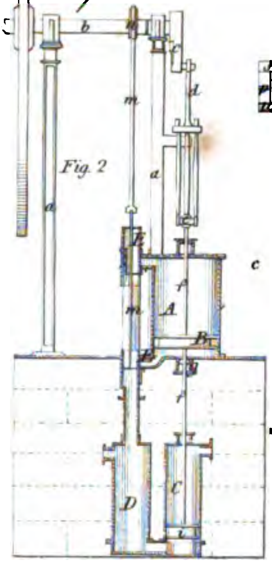


Fig. 2

Fig. 3

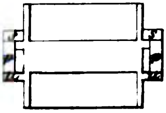
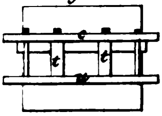


Fig. 4



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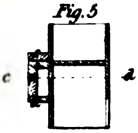

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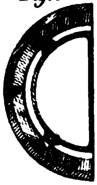
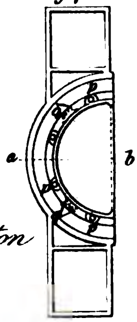


Fig. 7



Aitkin's Cotton Machine

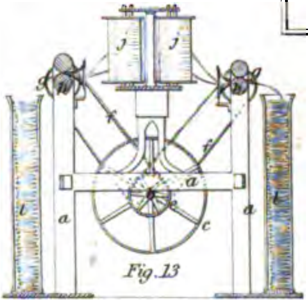
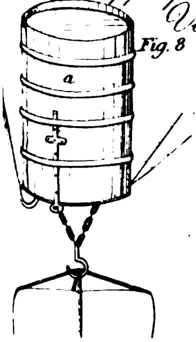
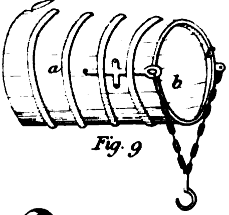


Fig. 13

Kemp's Appn. for Raising Sunken Vessels

Fig. 8





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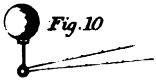
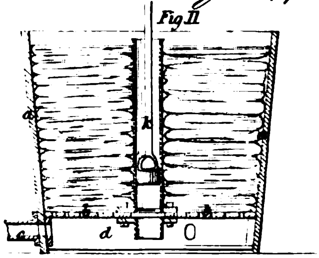


Fig. 10

Bridson's Bleaching Appn.

Fig. 11



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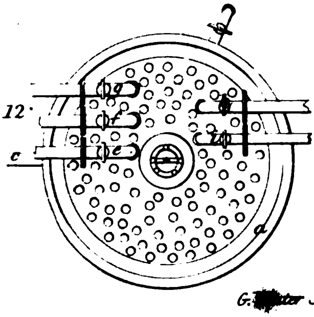


Douglus' Impd. Boilers

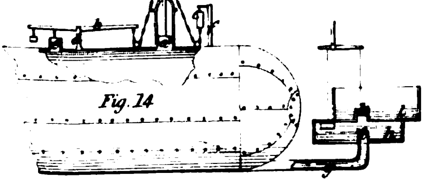


Fig. 14

Fig. 15

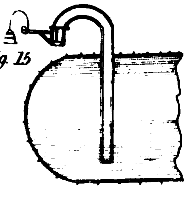
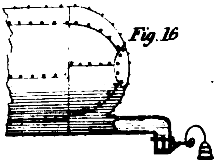
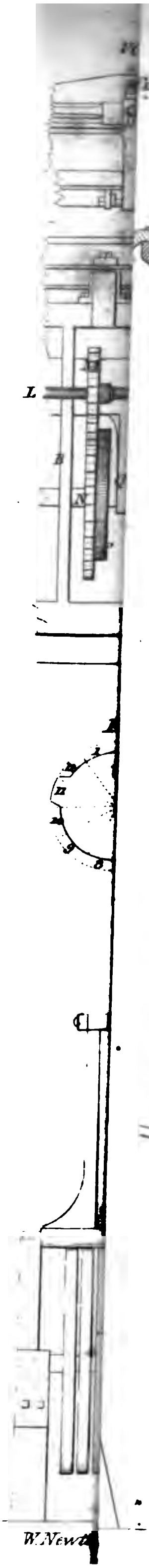


Fig. 16



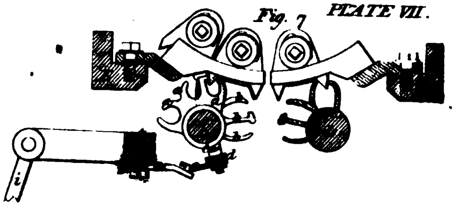
W. Newton Delt.   1 Novr. 1836   G. [illegible] Sculpt.

PLATE VII.



W. Newt

Fig. 7



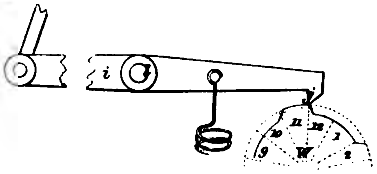
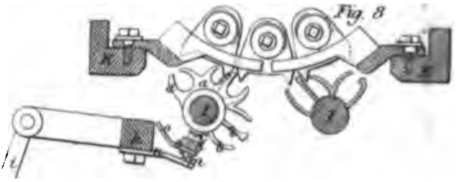
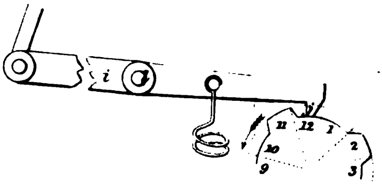


Fig. 8





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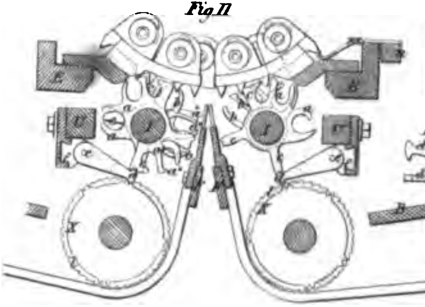

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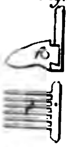

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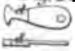
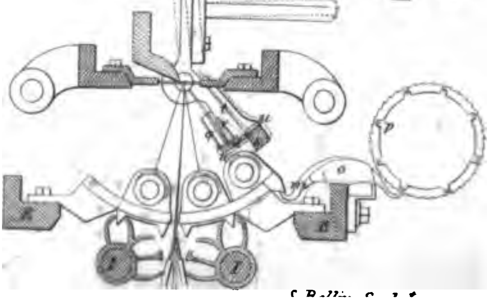


Fig. 16

Fig. 15

Fig. 14



S. Bellin Sculpt

Holmes's Improved Boiler

Fig. 3

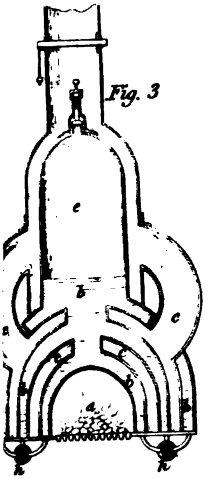


Fig. 4

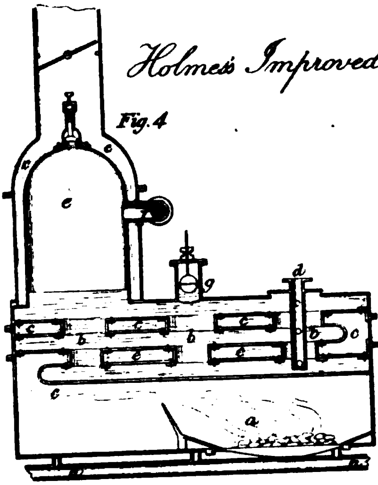


Fig. 1

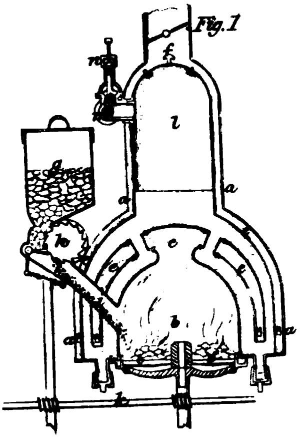


Fig. 9

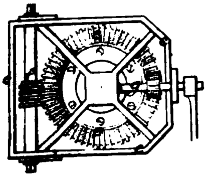
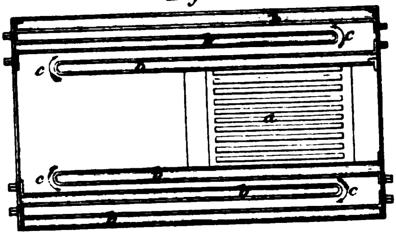


Fig. 5



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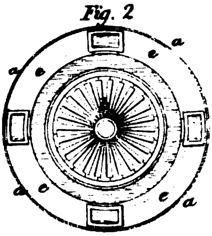


Brown's Capstan

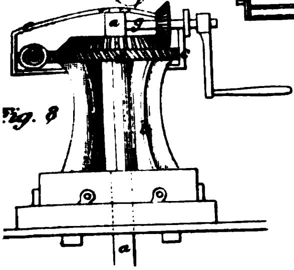


Fig. 8

Hall's Impd. Steam Engine

Fig. 7

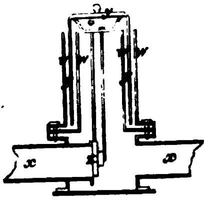
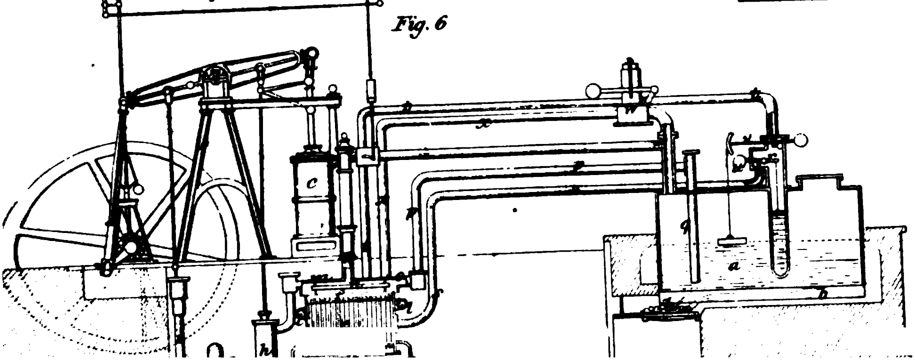
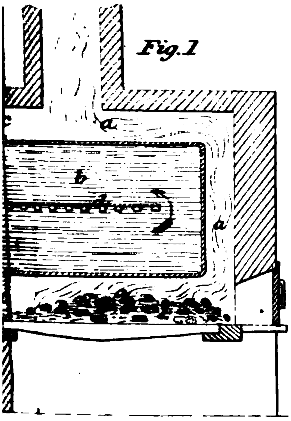


Fig. 6



IX CONJOINED SERIES PLATE XI.

Brunton's Boilers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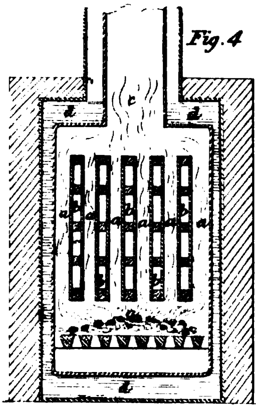
Fig. 4

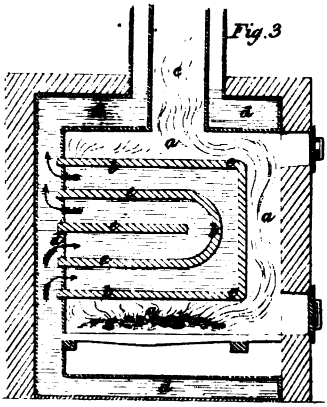
Fig. 3

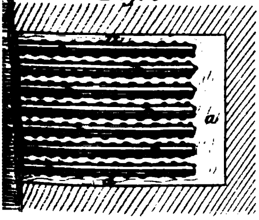
Fig. 2

Losh's Block Printing

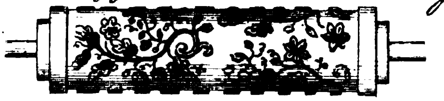
Fig. 9

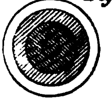
Fig. 10

Dundonald's Rotary Engine

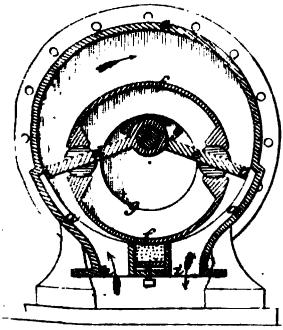
Fig. 6

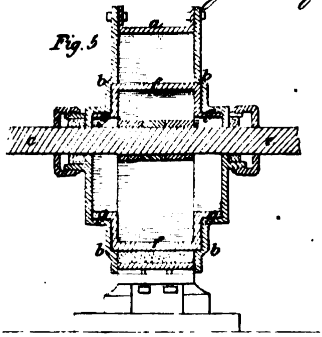
Fig. 5

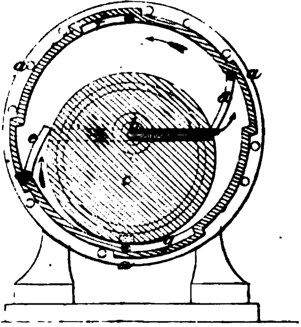
Fig. 7

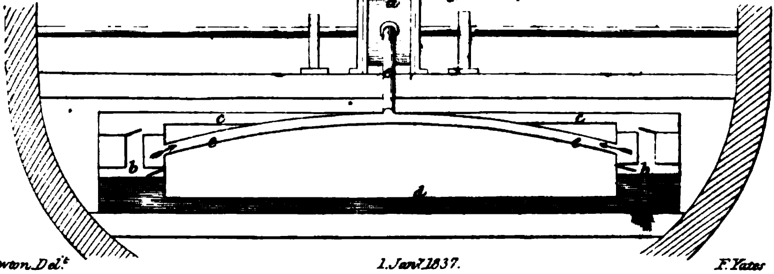
Fig. 8

W. Newton Del.t 1. Jan.y 1837. F. Yates Sculp.t

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aratus **PLATE XII.**

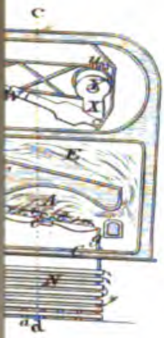


Fig. 5

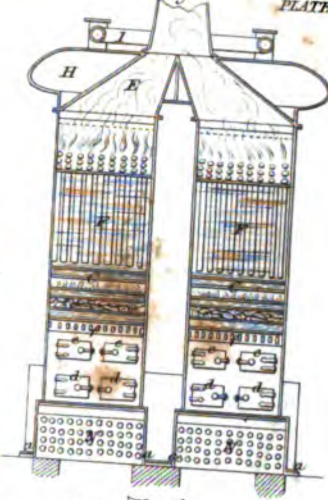
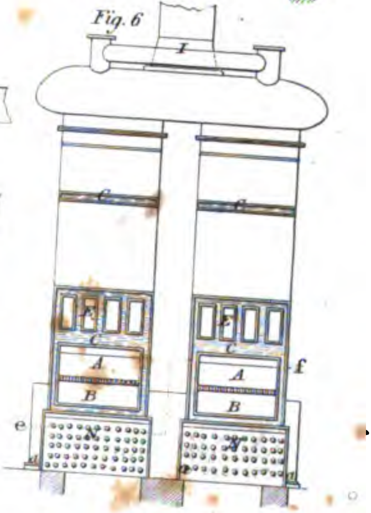


Fig. 6



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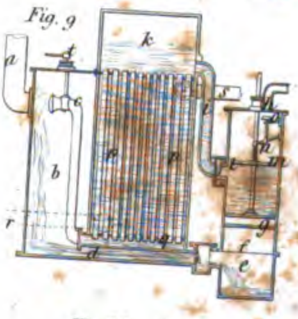
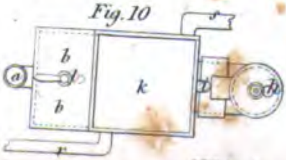


Fig. 10



G. Winter Sc.

Poole's Impd Cabs

Fig. 1

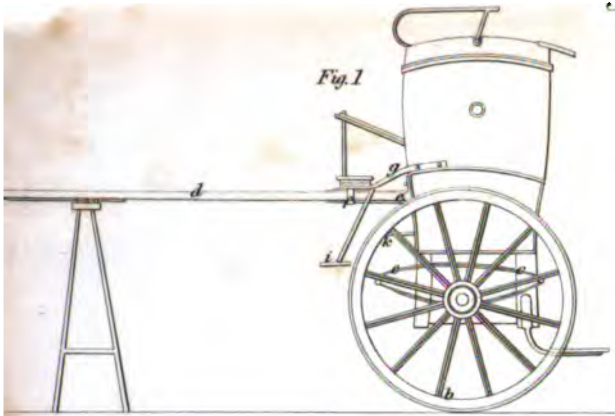


Fig. 2

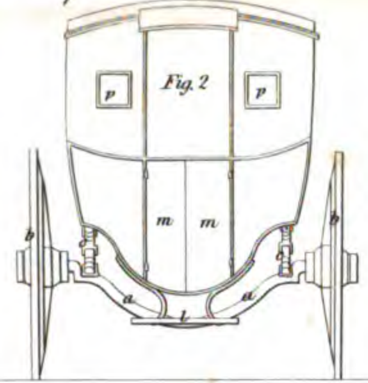


Fig. 3

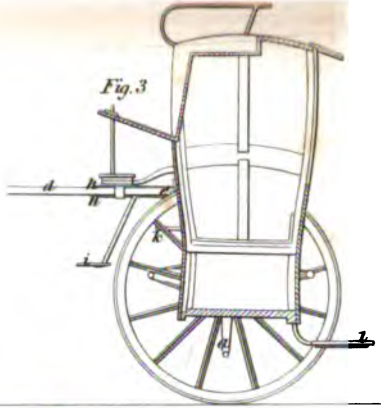


Fig. 4

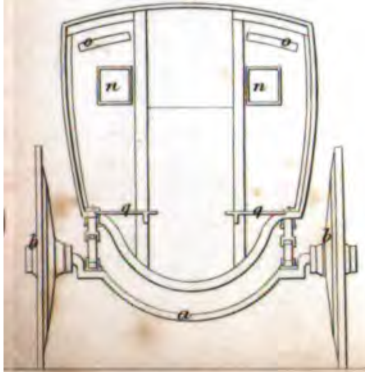


Fig. 5

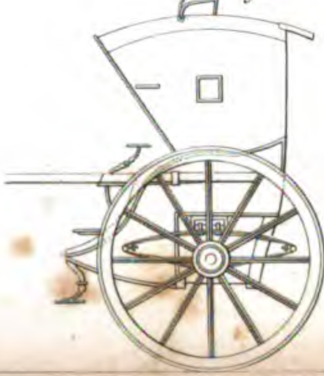


Fig. 7

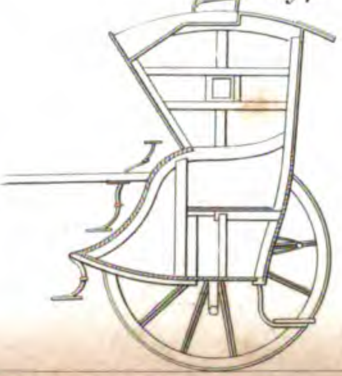
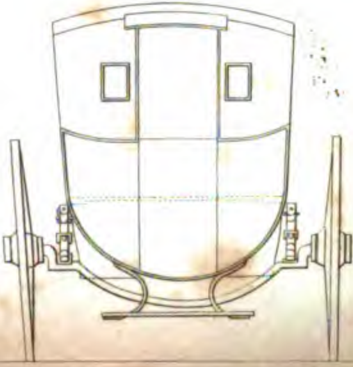
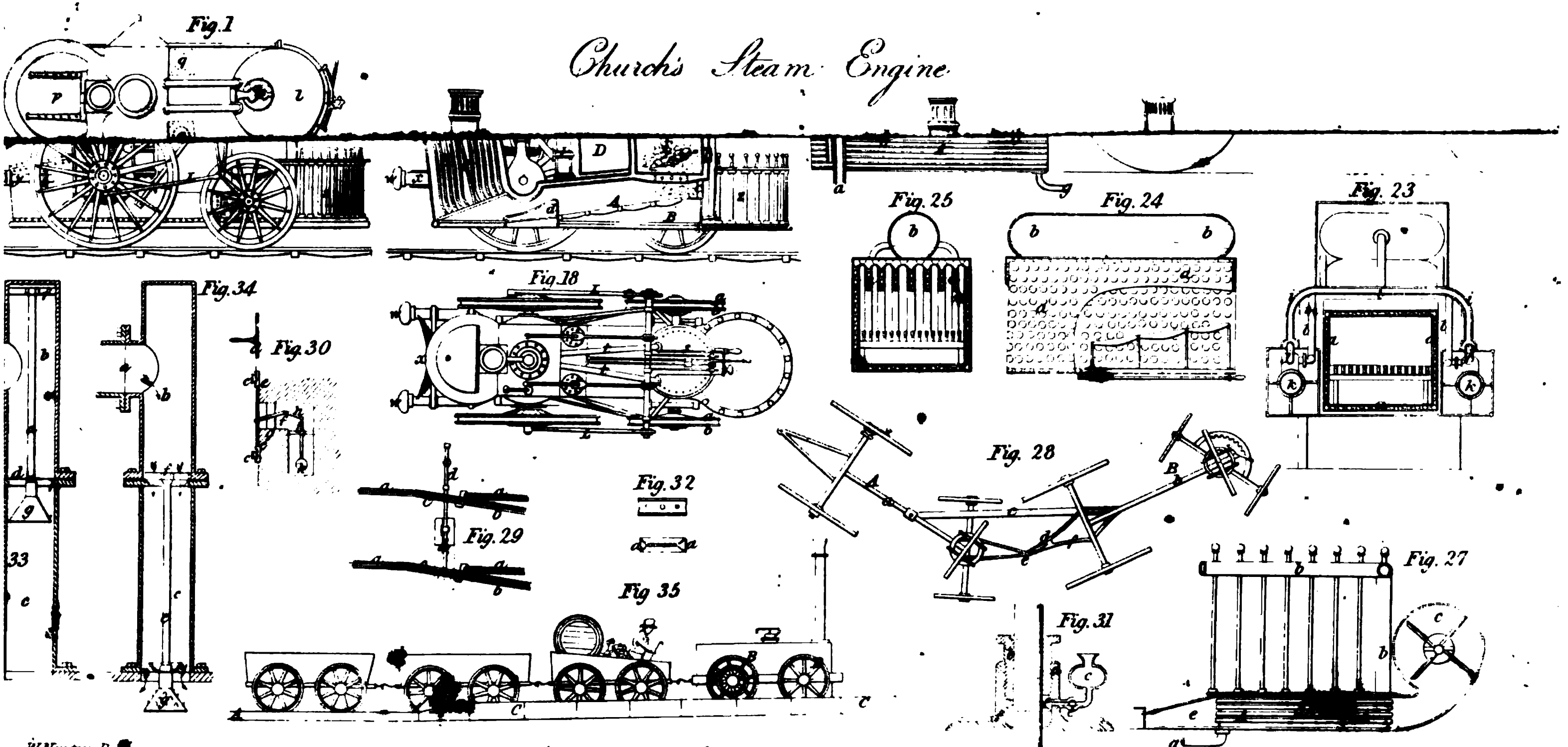


Fig. 6



W. Newton Delt   1. Feby 1837.   S. Bolin Sc.

Church's Steam Engine



W. Newton Delt. 1st March 1837 S. Bellin Sculpt.

[illegible]